Dental

Abstracts

A selection of world dental literature / Volume 4 · Number 2 · February 1959

VOLUME 4 · NUMBER 2 · FEBRUARY 1959

Dental Abstracts

A selection of world dental literature

Lon W. Morrey, D.D.S., editor
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AMERICAN DENTAL ASSOCIATION 222 E. SUPERIOR ST. CHICAGO 11

Published monthly by the American Dental Association at 1009 Sloan Street, Crawfordsville, Indiana. Entered as second class matter at the Post Office at Crawfordsville, Indiana, under the act of March 26, 1956. Change of address notices, undeliverable copies, orders for subscriptions, and other mail items are to be sent to editorial and executive offices, 222 East Superior Street, Chicago 11, Illinois. Printed in U.S.A. Subscription $8.00 a year in U.S.A.; $9.00 outside U.S.A. Single copy $1.00. Issue of February 1959, Vol. 4, No. 2. Copyright 1959 by the American Dental Association. All expressions of opinion and statements of supposed fact are those of the author of the abstracted article and are not to be regarded as expressing the views of the American Dental Association unless such opinions or statements have been adopted by the Association.

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3. To supply enough data in each abstract and digest that the reader may determine whether he wishes to refer to the original article for more complete information.

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Operative dentistry

A self-cleaning dental mirror

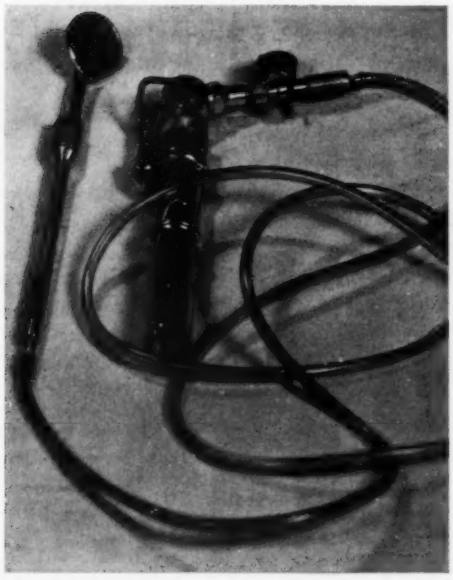
Walter M. Ormes, Jr. *U.S.Armed Forces M.J.* 9:983-986 July 1958

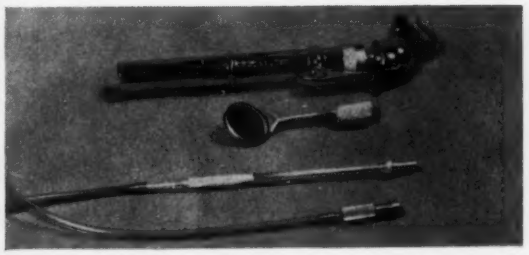
The use of high-speed dental handpieces and water-spray attachments renders the conventional dental mirror practically useless because the mirror shows an image distorted by water and debris. A new, self-cleaning mirror developed with the help of the Third Army Ordnance Section utilizes a stream of air on the surface of the mirror to blow away water and debris. The mirror, assembled and disassembled, is shown in the illustration.

The removable mirror section is fabricated from cast aluminum, with a flat tip adjacent to the mirror face so that the stream of air will sweep the surface of the mirror. The handle is a hollow tube for passage of the air blast. The plastic tubing slips off the end of the mirror handle, permitting sterilization of the mirror and handle. A U-shaped clamp is used to lock the air syringe in the "on" position.

The mirror has been used clinically with a high-speed handpiece with built-in water-spray attachment. The mirror has been found satisfactory in crown and bridge and operative procedures. The noise of the air rushing over the surface of the mirror is not objectionable to the patient. When the mirror is tilted toward the tooth being operated on, the field is dried in seconds for better observation.

Dental Detachment, U.S. Army Garrison, Fort McPherson, Ga.





The self-cleansing dental mirror assembled and disassembled

Silicate cements: how to select and use them

George C. Paffenbarger. *D.Practitioner* 8:387-390 Aug. 1958

The high solubility, low strength, extreme brittleness, high shrinkage and acidic and irritating character of silicate cement are tolerated simply because no other material has a better combination of desirable attributes as a direct filling material for the anterior teeth. The method of using silicate cement is all-important. The values for solubility, strength, shrinkage and the amount of acidic products available for tissue irritation can be varied depending on the method of using the cement.

The powders are complex aluminosilicates, usually fused with a flux containing fluoride. The high fluoride content probably accounts for the comparatively small amount of recurrent caries about silicate cement restorations. The silicate cement liquids are aqueous solutions of phosphoric acid partially neutralized by the addition of aluminum or zinc salts. The hygroscopic property of phosphoric acid is one of the factors that make the relative humidity of the air in which the cement is mixed important.

The powder is stable; the chief precaution is to keep the bottle of powder tightly stoppered except when removing the powder for mixing. The liquid, being susceptible to loss or gain of water, should be protected from the air as much as possible. This means that: (1) the stopper or cap should be in the bottle except when liquid is being withdrawn; (2) the liquid should not be placed on the glass mixing slab until just prior to beginning the mix; (3) the smallest possible area of the slab should be used in making the mix, and (4) ideally, the mixing should be done in a container which would protect the mix from the atmosphere.

The gel-like colloidal matrix, or the medium that cements the unused powder particles together, is the part that gives the silicate cement its undesirable properties. It is therefore important that the amount of matrix present in a mix of hardened cement should be kept minimal, through a proper mixing technic.

The mixing slab should be chilled to just above its dew point. The mix should be made as rapidly as possible—in about 30 seconds. The mix should attain a heavy, putty-like consistency. In brief, one should make a thick mix on a cool slab as fast as possible.

As soon as the mix is completed, it should be transferred to the cavity, and the retaining or contouring strip should be placed over it immediately, drawn taut and held in this position until the cement has hardened. If the correct amount of cement is packed into the cavity, the minimum amount of finishing will be required. After the strip is withdrawn, the filling should be coated with a grease such as petrolatum U.S.P., or preferably a silicone stopcock grease. The coating protects the filling from saliva or air, to preserve the water content of the filling for a few hours after insertion.

If the contouring strip has been adjusted properly, the lingual surface of the filling should require little or no finishing. Polishing should be delayed at least 24 hours, as the cement is weak just after removal of the retaining strip. The finest grit of cuttlefish disks should be used slowly and should be covered with a grease so that the surface of the filling will be protected from the air. Under no circumstances should the filling be made flush with the enamel margin just after removal of the strip. If the patient is a mouth breather, he should be instructed to coat his silicate fillings with petrolatum every night before retiring; otherwise the restorations will last only a few months.

A silicate cement restoration may be either a work of art or a disappointment, depending on the technic that is used in mixing, packing and finishing.

National Bureau of Standards, Washington, D.C.

Prosthetic dentistry

The importance and application of the "nose blow" line in the upper denture

John E. Ackerman and A. Boehm. *J.Ontario D.A.* 35:8-11 April 1958

The "nose blow" line is an important anatomic landmark in the upper arch that often has been overlooked by the dentist in constructing complete upper dentures. The "nose blow" line is the line of attachment of the terminal fibers of the muscles of the soft palate to the crest of the palatine bone. It should be the limit to the distal palatal extension of any complete upper denture. The determination of the position of the muscle attachment is at least as important to the stability of the denture as are the locations of the labial and buccal frenums.

Nearly all upper dentures made today are finished at what is believed to be the border between the hard and soft palates. This usually is called the "Ah" line, because it can be seen when the patient says "Ah."

The dentist unfamiliar with the "nose blow" line can discover it by noticing the downward deflection of the soft palate when the patient, with mouth open, tries to blow his nose held closed with his thumb and index finger. If both the "Ah" and "nose blow" lines are marked with an indelible pencil, it can be seen that they are separate lines. The "nose blow" line always is anterior to the "Ah" line; on the average, the two lines are from 5 to 10 mm. apart at the widest point.

The following procedure is used to obtain the "nose blow" line:

1. The tray constructed for the final impression is trimmed at the back to extend up to and not beyond the "Ah" line.

2. A relief or reverse post-dam is cut at the posterior border of the tray, about 2 mm. deep, gradually tapering forward for about 1 inch. No post-dam should be applied to this area of the impression tray.

3. The patient's head is tilted forward so that he will not swallow any excess paste. By this forward inclination of the palate, gravity will not act on the soft paste and cause it to flow backward after it has been forced forward by the patient's blowing his nose during the taking of the impression.

4. After the tray has been fitted comfortably, and the labial and buccal muscle molding completed, the patient is instructed to practice blowing his nose with his mouth open, and also to practice moving his mandible to the right and left.

Left: The conventional "Ah" line compared with the shorter "nose blow" line. Center: An unusual "nose blow" line compared with the straight "Ah" line. Right: The finished denture made from the model shown in center illustration

5. A soft zinc oxide-eugenol paste that sets hard is recommended.

6. When the final wash impression is taken, the patient is asked to open his mouth wide and to move his mandible four or five times from left to right while trying to blow through his oc-

cluded nose. This is done while the paste is setting.

7. The dentist should score the post-dam on the model before having the denture finished.

The same procedure is observed in shortening or relining an over-extended complete upper denture to the more correct "nose blow" line.

Although some prosthodontists assert that extending the distal border of the denture will result in more retention, the author has found that shortening the palatal denture-bearing area to the "nose blow" line increases denture stability and comfort.

168 Dundas Street West, Toronto, Ontario, Canada

Cleansing of dentures

Jørgen Theilade. *Tandlaegebl.* 62:41-44 Jan. 1958

Proper instruction of the patient in cleansing his dentures is important, not only to prevent fetor, irritation of the mucosa, and caries of the remaining teeth, but to prevent damage to the denture. The patient should be warned against the use of hot water and solvents. Cleansing should be done over water, to avoid breakage if the denture is dropped. Normally, dentures are cleansed with a brush and water, often with the addition of some chemical. In a good denture brush, the ends of the individual bristles should be rounded rather than sharp so that the denture material will not be scratched.

Twelve different cleansing mediums were tested for their efficiency in removing the stains of strong tea, concentrated bouillon, tobacco, and calculus. Among the cleansing mediums were four commercially available denture cleansers (Steradent, Polidol, Puryl and Taxi), a 2 per cent solution of chloramine, sodium chloride, ordinary hand soap (80 per cent), detergent soap, and various detergents in solution and in powder form, of the types used in household laundry and dishwashing agents, including some detergents with oxidizing and enzymatic agents.

Anterior porcelain teeth were attached to clear acrylic plates to establish interdental spaces. The specimens were immersed in strong tea and in strong meat bouillon for 24 hours. If directions were given for the use of the cleanser, they were followed; otherwise the specimens were brushed for one minute with the cleansing agent. (Most patients spend only from 15 to 20 seconds in cleansing their dentures.)

Similar denture specimens were exposed for two hours to pipe smoke in a "smoke machine." Attempts to deposit artificial calculus failed; instead, the 12 cleansing agents were tested on clinical dentures with deposits of calculus. Scratching of the various agents was observed at a magnification of 60. Results were tabulated for each of the 12 agents tested.

The four commercial denture cleansers used were rather efficient; one (Steradent) did not dissolve calculus. Immersion alone was less effective than brushing.

The chloramine solution had no visible effect. Ordinary hand soap or detergent soap were superior to the other agents, except in removing calculus.

The other agents tested were less effective. Detergents alone, or with oxidizing and enzymatic agents, appeared to require longer cleansing time than did ordinary soap.

The use of ordinary hand soap with a properly designed brush is the most satisfactory method for the daily cleansing of dentures.

Danmarks tandlaegehøjskole, 4, Universitetsparken, Copenhagen, Denmark

A follow-up examination of crown and bridge prostheses

Nils Bäcklund and Nils Åke Åkesson. *Odont.Revy* 8:121-133 April 1957

An investigation was made to find out what had happened to crown and bridge prostheses made in the prosthetic department of the Royal Dental School and worn for two years. The results are published in 16 tables. Factors studied were mobility, traumatic occlusion and articulation, contact relations, kind of gold, discoloration of gold and acrylic facings, the adaptation of the gold to the teeth, the appearance of the gingivae, secondary caries, oral hygiene, sensitive cervical areas, fractured facings and pontics. Because of the lack of complete records at the insertion of

the prostheses, no general conclusions could be drawn. However, the following results were noted:

1. Increased mobility was noted more often in separate units than in bridges under similar occlusion and articulation.

2. Hard gold showed less distortion at the edges of the castings and was superior to the karat gold as regards the influence on the gingiva and resistance to discoloration.

3. Processed acrylic facings and pontics showed a good tenacity and resistance to discoloration.

4. Secondary caries occurred more often in abutment teeth which had three quarter crowns than in those with full crowns.

About 75 per cent of the crowns and 69 per cent of the bridges had increased mobility.

Royal Dental School, Malmö, Sweden

Modern concepts of reflexes and registrations to obtain centric occlusion and centric relation in prosthetic dentistry

Umberto Bar and Niels Brill.
Minerva stomat. 7:40-47 Feb. 1958

The determination and registration of the centric relation between the upper and lower jaw are the most critical procedures in modern prosthetic dentistry.

In persons with an intact natural dentition, the centric occlusion is determined by the neuromuscular, neuroarticular and "neuroperiodontal" functions. The physiologic vertical dimensions and the centric relations at the natural vertical dimension are determined by the neuromuscular and neuroarticular functions.

In patients with complete dentures, however, the centric occlusion is determined by neuromuscular, neuroarticular and "neuromucosal" functions.

Prior to the introduction of physiologic principles to prosthetic dentistry, the centric relations and the vertical dimensions were determined by mathematical and mechanical procedures.

Modern concepts of the reflexes and registrations to obtain centric occlusion and centric relation in prosthetic dentistry include dental physiology, not only as a diagnostic aid but also as a determining factor.

Neuromuscular actions and reactions, however, are less easy to determine and to measure than are tooth and bone relationships. In the construction of complete dentures, these actions and reactions must be taken into consideration because the occlusal patterns of the artificial teeth should contribute to the physiologic (functional) and the psychologic (esthetic) adaptation of patients to the inserted dentures.

The postural position of the lower jaw exerts the only reflex determining the mandibular position present at birth. Centric relation is acquired after tooth eruption; it is the first acquired reflex determining the occlusal position of the lower jaw after the deciduous dentition is completely erupted. Eccentric mandibular positions are acquired as an expedient mechanism to avoid occlusal disharmony. They are abandoned as soon as the source of the afferent impulses instigating them is eliminated.

Correct centric registration has no bearing on the type of articulator used. The accurateness of the centric occlusal record is essential whether a simple hinge, an adjustable or an anatomic articulator is employed.

The lack of simultaneous contact of the surfaces of the opposing teeth must cause distortions of the underlying mucosa and submucosa. This distortion results in an occlusal record which, although it seems correct in the anteroposterior plane, is incorrect in the vertical or superiorinferior plane. This incorrectness produces occlusal disharmony with consequent pain and discomfort.

In complete denture prosthesis the centric occlusion must coincide with the centric relation. This critical relationship is less apparent in partial prosthesis than complete prosthesis. In partial dentures, fixed bridges, periodontal and orthodontic appliances, a deviation between centric occlusion and centric relation can be acceptable as long as it is not detrimental to dental health.

In complete prosthesis, however, it will often be necessary to remodel the occlusal pattern by grinding until all deviations between the centric occlusion and the centric relation are eliminated and, thereby, optimal function is obtained.

Clinica Odontoiatrica dell'Universita, Turin, Italy

Orthodontics

A mobile orthodontic chairside desk

F. D. Rowe. *D.Practitioner* 8:256-257 April 1958

The operative procedures involved in orthodontic practice can be performed with the dentist in a seated position. A desk (Fig. 1) has been designed to save time and effort and to facilitate treatment while the operator is seated. The desk is mounted on easy-running, spherical casters and can be moved into the position most convenient for the job in hand. It eliminates time-wasting movements in the construction and fitting of appliances. Its extension leaves can be used for writing diagnostic notes and records.

Almost everything required for treatment (except the sterilizer) can be arranged to be within arm's length of the operator when seated. The following items can be accommodated:

1. Chrome alloy strip and wire, housed in two built-in boxes at the rear of the central kneehole. When the strip and wire are needed, a flap covering the chamber is raised by pressure on a convenient foot pedal. The dispenser will accommodate 28 varieties of material wound on two sizes of spools. A panel in the back of the desk can be removed to give access for loading the spools in the dispenser.

2. Pliers, burs and stones (Fig. 2), mouth instruments, impression trays (Fig. 3), mixing bowls, mixers, measured impression material, cements, glass slabs, cotton wool holder, cotton rolls, waste receiver, wax, x-ray film, x-ray cassettes, plastic containers for appliance components, chrome alloy tubing, oral hygiene leaflets and rubber bands.

3. Wire and strip cuttings, powdered acrylic resin from trimming plates, and so forth, can be

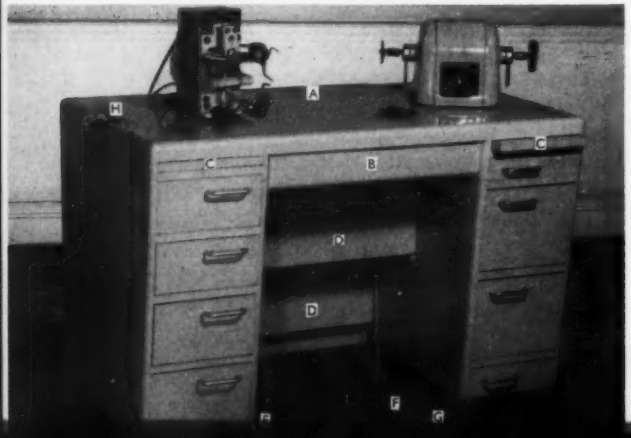


Figure 1 A = flap concealing wire dispensing chamber, elevated by foot pedal G. B = waste drawer. C = extension leaves. D = boxes housing spools of chrome alloy strip and wire. E = foot pedal for welder. F = foot control for grinding lathe. G = foot pedal for flap covering dispenser chamber. H = holder for impressions in trays

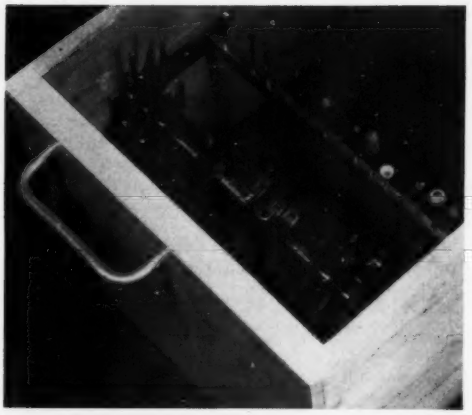


Figure 2 Drawer containing plier rail and bur and stone rack

Figure 3 Drawer containing impression trays

placed in a receptacle in a wide, centrally placed waste drawer.

4. A wooden stand fits in one of the drawers and holds six measures of hydrocolloid impression material and two measures for water.

The orthodontic chairside desk is 32 inches high, 45 inches wide, and 24 inches deep. The kneehole is 22 inches wide. The eight drawers are 10 inches wide. The top is of Formica placed over sound-deadening material. The corners are rounded, and the desk is finished in light enamel.

11 Cromer Road, Hillside, Southport, England

Growth aspects in the diagnosis of malocclusion

A. G. Brodie. *Internat.D.J.* 8:287-288 June 1958

Although most types of malocclusion are related principally to heredity, the hereditary influence expresses itself in different ways, only one of which is the morphologic pattern. Of equal importance, however, are less tangible factors: time and order of eruption, time, rate and duration of growth, and the relations between all these.

The orthodontist is dealing with three distinctly different systems, namely, teeth, bones and muscles.

The teeth attain their full size in the early years of life and long before they are to function. The 12 anterior teeth of the permanent dentition, being considerably larger than their predecessors, can be accommodated in the young child's jaws only by a very irregular positioning of their crypts.

The teeth of deciduous and permanent dentitions exhibit wide variations in the order and time of eruption. These variations seem to be largely independent of the level of growth.

Jaw growth, unlike tooth eruption, is a steady process of enlargement, but it also varies greatly between individuals. Thus, two individuals with teeth of almost the same size may show different levels of jaw development at the same age. Another factor further complicates this situation. Jaw growth is a continuous variable, the jaws increasing in size by infinitesimal degrees. The teeth represent a discontinuous variable, since a whole tooth must be accommodated at one time. Consequently, if, at the time of the eruption of any tooth, growth has not provided sufficient room for its accommodation, the jaw will be crowded.

Since the jaws must grow over a long period of years to attain their adult proportions, the ratio between them and the teeth constantly will become more favorable. There seems to be a correlation between success in treatment and the growth of jaws.

The success of the author in using extraoral forces in the management of patients with Class II malocclusion has strengthened his conviction of the importance of growth.

Knowledge of muscle tissue is not as far advanced as that of teeth and bones. Only recently have methods been designed that may permit muscle tissue to be studied quantitatively. Clinical observation indicates the need for information about its variability in the time, rate and potential of its growth.

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Growth changes of the dental arches—a longitudinal study

Coenraad F. A. Moorrees. *J.Canad.D.A.* 24:449-457 Aug. 1958

The purpose of this study was to measure the breadth, length and circumference of the dental arches during the growth and developmental period of children, and to use the observations in combination with data on tooth size for predicting the alignment of the permanent teeth. The material used in this study consisted of serial dental casts of 184 North American white children.

The size of the dental arches differs widely among individuals at all ages. The changes in arch length and intercuspid distance between three and five years of age, in both the maxillary and mandibular dentition, are small and compensate each other. The intercuspid distance increases, probably as a termination of an increment phase of arch breadth which originated before the age of three years. Arch length decreases after mesial drift of the deciduous molars with closure of the interdental spaces between the deciduous molars and cuspids.

Between five and ten years of age, when the permanent maxillary and mandibular central and lateral incisors emerge, the intercuspid distance increases about 3 mm. The decrease in arch length, beginning at four years of age, continues until the age of six. Thereafter, arch length increases, especially in the maxilla (1.0 mm.), as a result of the greater labial inclination of the permanent incisors compared with that of their deciduous predecessors.

Beginning at 10 years of age and continuing until 14 years, the arch length decreases once more (1.5 mm. in the maxilla and 2.5 mm. in the mandible), primarily because the mesiodistal crown diameters of the bicuspids generally are smaller than those of their deciduous predecessors.

The maxillary intercuspid distance increases during a third increment phase which starts shortly after ten years of age, adding about 2 mm. to this distance. In the mandible, the intercuspid distance decreases slightly between 10 and 14 years of age.

The changes in arch length and the intercuspid distance are small after 14 years of age. The mean length and breadth of the dental arches are smaller in the females at all ages, but the total increments in these arch dimensions are similar in both sexes. The range of individual variation in the absolute intercuspid distance and arch length is large, and pronounced differences occur also in the age changes of these two dimensions.

The mean increase in the circumferences of the maxillary dental arch between 5 and 18 years of age is small (+ 1.3 mm. in boys and + 0.5 mm. in girls). In the mandible, the arch circumference is 3.4 and 4.5 mm. smaller in the average boy and girl, respectively, at 18 years than at 5 years of age.

The observations emphasize the importance of studying children longitudinally to determine the developmental pattern characteristic of each individual. The examinations should be conducted according to a biologic time schedule instead of a chronologic one because the changes in the breadth and length of the dental arches are associated in a general way with the emergence of the permanent teeth.

A minimum of three dental casts should be obtained in pedodontic practice, namely: (1) of the deciduous dentition before the permanent mandibular central incisors emerge; (2) of the transitional dentition before emergence of the permanent maxillary central incisors, and (3) of the transitional dentition after the emergence of the permanent maxillary lateral incisors when crowding of the lateral incisors occurs most frequently in both jaws.

Cephalometric roentgenograms also should be obtained at these visits for an evaluation of the growth pattern of the face. Intraoral or lateral roentgenograms of the jaws supply added information concerning the sequence of emergence and root formation of the permanent teeth for estimating dental maturation.

The routine longitudinal observation of patients enhances the possibility of predicting aberrations in growth and instituting appropriate interceptive procedures.

Forsyth Dental Infirmary for Children, Boston, Mass.

Oral surgery

Dental service utilization of orthopedic brace shop facilities

Heyl G. Tebo. *Mil.Med.*
123:136-137 Aug. 1958

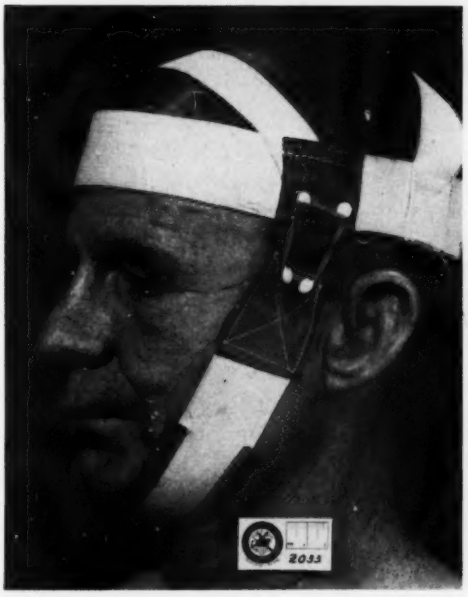
Medical centers offer many facilities to their dental staffs. The Dental Service at the Veterans Administration Hospital in Houston, Texas, has utilized with continuing success the services of the orthopedic brace shop for the fabrication of extraoral appliances in the treatment of jaw fractures.

A patient with a bilateral fracture involving the necks of both mandibular condyloid processes had an edentulous maxilla and only six mandibular teeth. A maxillary acrylic splint was fabricated and used in conjunction with a headcap fabricated as follows:

The headband was made of cotton webbing 1½ inches wide, supported by cotton webbing 1 inch wide with tooling calf leather at either end for the attachments. The chin piece was lined with horsehide leather (adhesive moleskin plaster could have been used). Standard shoe hooks were used for attachment of the traction devices, which were ordinary, large rubber bands.

The chin strap also may be attached with webbing buckles. The position and direction of the straps leading to the chin piece may be changed to obtain the necessary forces desired by the oral surgeon. The chin piece may be further modified by being formed of aluminum or self-curing acrylic resin for more definite stabilization.

The appliance may be fabricated directly on the patient in the orthopedic brace shop if the patient's condition permits. If the patient is nonambulatory, measurements can be made and the appliance fabricated in the shop and fitted in the ward. Such appliances are well tolerated by patients, as they are lighter and more comfortable than appliances made of plaster, paper or metal. The headcap described may be removed for necessary care of the hair and for shaving. The appliance is not intended to replace those of plaster or metal which are utilized when force is needed to exert considerable pull other than in an upward and backward direction.



Acrylic splint used in connection with headcap and side view of headcap for stabilization of bilateral condylar fractures

Veterans Administration Hospital, Houston 31, Texas

Tic douloureux: permanent cure by injection of hot water into gasserian ganglion

Rudolph Jaeger. *J.Oral Surg.* 16:395-399 Sept. 1958

A new method has been developed for curing permanently the pain of tic douloureux by injecting the gasserian ganglion with hot water while the patient is under light anesthesia and roentgenographic visualization.

Anatomically, the vital center of the nerves carrying all types of sensation from the face, eyes, upper and lower jaws and the tongue is in the nerve cell bodies in the gasserian ganglion structure. When hot water is injected into the cluster of ganglia cells which make up the bulk of the large, semilunar-shaped ganglion, death or weakening of these cells occurs and there is a complete loss or diminished sensation in the face which is permanent. By a selection of cells for injection in those parts of the ganglion which have fibers passing to the portion of the face afflicted with pain, a sensory loss will result only in that part of the face so afflicted.

The hot water injection is carried out in the hospital with the patient under light thiopental sodium anesthesia and with the patient's head resting on the cassette holder of a Franklin neurosurgical x-ray unit. When the patient is barely unconscious, an 18 gauge spinal needle is passed through the cheek at the corner of the mouth. The needle is advanced between the maxilla and mandible toward the foramen ovale. When the needle strikes the base of the skull, the precise position of the point in relation to the foramen is located on the x-ray film. If not precisely placed in the foramen, the needle is moved so as to pass through this skull opening. With patience and some maneuvering, the surgeon can feel the needle pass through the foramen. It must be passed only about 10 mm. through it and never more than 17 mm. Cerebrospinal fluid may escape when the needle stylet is withdrawn. If so, only 0.5 cc. of water at 80° C. is injected, and the patient's face then is tested with a pinprick to determine the degree of sensory loss at the pain site. Under light anesthesia, the patient will react by squirming slightly when a fully sensitive portion of the face or body is pricked. If the painful area has not been numbed sufficiently to produce permanent relief, the injection is repeated with a larger quantity of water at the same temperature or even at the boiling point.

At no time is it permissible to inject more than 2.5 cc. of water at a single dose. Occasionally it is necessary to repeat the injection a day or so later to obtain the desired result. It is not often necessary to produce complete facial anesthesia to stop the pain of tic douloureux. It usually is sufficient to numb slightly only that part of the face where the major discomfort is located.

Since this is a highly technical procedure involving entering the cranial cavity and injecting only the gasserian ganglion cells, its use should be restricted to neurosurgeons.

In 130 patients who have had ganglion injections, there have been no deaths or near deaths and no facial paralysis. No other method for the permanent cure of tic douloureux comes near matching this record. There is a temporarily paralysis of the muscles of mastication on the injected side in many instances; this disappears in from three to five months. It is perfectly safe subsequently to inject the opposite ganglion for tic pain in the other side of the face, should it occur there. There is no interference with the chewing of food or the retention of dentures.

Six per cent of the 130 patients have had temporary weakness of the muscles which rotate the eye. This leaves when the nerve regenerates.

Jefferson Medical College, Philadelphia, Pa.

Electromyographic study of cleft palate

Choh-Luh Li and Arne Lundervold. *Plast.& Reconstr.Surg.* 21:427-432 June 1958

The palatine musculature in 11 patients with cleft palate was studied by electromyography before and after surgical reconstruction. A control group with normal palates consisted of three adults, a child and an infant. The method was essentially that described in 1953 by the authors.

The following conclusions were reached:

1. Muscle action potentials in the soft palate of normal subjects and of patients with cleft palate frequently have the same recorded shape and size as the potentials recorded from skeletal

muscles. Polyphasic motor units are observed more frequently in patients with cleft palate.

2. No evidence of denervation in the muscles of cleft palate is found either before or after surgery.

3. Electromyography may be useful for detecting the amount of functioning muscle fiber in the cleft palate as a preparation for surgical repair, and in arriving at the prognosis for speech therapy.

National Institutes of Health, Bethesda, Md.

Some observations on blood loss in hare-lip and cleft palate surgery

Michael N. Tempest. *Brit.J.Plast.Surg.* 11:34-44 April 1958

Although more careful preoperative investigation, better surgery, modern anesthesia and the introduction of antibiotics have eliminated many of the former hazards of cleft lip and cleft palate surgery, blood loss at operation may be considerable and unexpected. Unless its extent is appreciated and the deficiency corrected, postoperative complications may be encountered. Recent studies have confirmed that much of the posttraumatic or postoperative debility—the so-called "illness of trauma"—is due to failure to restore the blood volume to its normal level.

Estimations of blood loss were carried out on a series of 234 operations for the repair of cleft lip and cleft palate. An attempt was made to relate the volume of blood lost to the nature and extent of the operation, the age and the expected blood volume of the patient, and the surgical and anesthetic technic used.

A postoperative picture identical to that described as the "illness of trauma" was seen on 45 occasions in children under the age of three years. This clinical picture was not seen in any of the adult patients, most probably because the blood loss was more readily observed and corrected at the time of operation.

Losses of 200 ml. or more of blood in a child under the age of three years should be taken seriously, especially if the preoperative hemoglobin concentration is low and if further bleeding is likely to occur after return to the ward.

Ten of the 45 children with "illness of trauma" were given blood transfusions. The dramatic response in their condition contrasted strikingly with that of those who after operation received iron preparation only, orally or by intramuscular injection. The "illness of trauma" seen in this series never presented a serious threat to life, but the listlessness and pallor of the children were striking, and the temporary lowering of their bodily resistance might have opened the way to a virulent hospital infection.

No relation was found between blood loss and defective wound healing, or between blood loss and the incidence of upper respiratory infection.

Certain modifications in surgical and anesthetic technic were found to reduce blood loss substantially. Clean cutting, careful dissection in the correct tissue planes, gentleness, and avoidance of vigorous swabbing with gauze, all reduce blood loss. In cleft lip and cleft palate surgery in adults, hypotensive anesthesia is indispensable.

Blood loss should be measured at all operations for cleft lip and cleft palate in infants and young children, and at particularly difficult operations in adults. The information thus gained provides a more rational basis for transfusion therapy, especially in the very young in whom an apparently insignificant loss may represent a serious deficit in the total blood volume.

St. Lawrence Hospital, Chepstow, Monmouthshire, England

Removal of impacted third molars using speeds up to 200,000 r.p.m.

H. C. Kilpatrick. *Oral Surg.,Oral Med. & Oral Path.* 11:364-369 April 1958

In 30 patients, 30 impacted third molars were removed by means of the mallet and chisel, and 28 additional impacted third molars and two impacted bicuspids were removed by the ultraspeed technic. In 24 of the patients there was less postoperative swelling after ultraspeed extraction than after removal with mallet and chisel. In six patients, postoperative swelling was the same after extraction by both methods. Twenty-two of the patients experienced less pain after ultraspeed extraction than after extraction with mallet and chisel. In six patients the pain was the same after both methods. Two patients experienced slightly

more pain after extraction by the ultraspeed technic than after extraction with mallet and chisel.

In six patients, more bleeding occurred after extraction by the ultraspeed method than after extraction by mallet and chisel. In 20 patients, bleeding was the same after both types of extraction. In four patients, less bleeding occurred after extraction by the ultraspeed method than after extraction by mallet and chisel.

All patients expressed an overwhelming preference for use of the ultraspeed technic.

In the ultraspeed technic of extraction, an incision is made and the flap is retracted. Occlusal, buccal and lingual bone is removed to a depth of about 4 mm. around the impacted tooth with an ultraspeed drill. Speeds up to 150,000 rpm are used. The coolant consists of tap water used as a fine mist under 30 to 40 pounds of pressure.

If the tooth is impacted tightly under the adjacent tooth, the crown of the impacted tooth is cut away with a no. 558 bur at 150,000 rpm. The remainder of the tooth then is elevated from its bony crypt. The socket is cleaned, insufflated with a mixture of penicillin sulfonamide powder with sulfanilamide, and closed with sutures. If indicated, a drain of ethyl aminobenzoate on gauze is inserted.

Postoperative bleeding in the first patients exceeded the average because an excessive amount of coolant was used.

27 Ludlow Street, Yonkers, N.Y.

Primary repair of cleft palate

Arno Münnich. *München.med.Wschr.* 100:1073-1076 July 18, 1958

From 30 to 40 per cent of patients with cleft palate speak imperfectly as the result of inadequate palatopharyngeal closure after standard cleft palate operations.

The "V-Y" method, practiced for more than 25 years, aims at both the closure and the elongation of the palate. Although this method deals adequately with narrow clefts which are bordered by substantial palatal elements, its use for treatment of wider clefts is disappointing. The small, poorly developed palatal elements associated with wide clefts do not possess sufficient tissue to provide closure and elongation of the palate, and in those instances the V-Y operation results in a velum which, although it consists of one piece, is too short to effect palatopharyngeal closure during speech.

At the clinic of oral surgery of the Humboldt University in Berlin, a sufficiently effective pharyngoplasty is performed prior to the standard repair of cleft palate; the posterior and lateral walls of the pharynx are thereby advanced to such an extent that the classical V-Y operation is no longer necessary. A much simpler palate repair technic is employed in which the soft tissues of the palatal elements are used only to close the cleft from side to side without attempting to lengthen the velum at the same time. The surgical damage to the palate is minimized and a velum is produced which, although comparatively short by customary standards, possesses a high degree of mobility.

Pharyngoplasty by transplantation of muscles creates a mucomuscular flap turned upward. The flap is raised on each lateral pharyngeal wall, the upper end of each flap lying at the level of the lower border of the adenoid pad or just below the level of the eustachian cushions in older patients in whom the adenoid pad has atrophied. Each flap consists of the entire thickness and width of the lateral pharyngeal wall.

The two flaps are transposed upward and inward until they lie with their deep muscle surfaces in a transverse mucosal incision which is made across the posterior pharyngeal wall.

A prominent contractile posterior pharyngeal ridge is created, and considerable narrowing of the transverse diameter of the pharynx follows closure of the secondary defect on the lateral walls of the pharynx resulting from the raising of the two mucomuscular flaps.

The palate is then closed by a modification of the V-Y procedure by freshening and suturing in two layers.

Primary repair of cleft palates by the combined surgical methods has been performed on infants from 12 to 15 months old. In most instances, however, surgery should be postponed until the patient is 18 months old.

Scharnhorst Strasse 3, Berlin N 4, Germany

Some comments on the health aspects of roentgen diagnosis in dentistry

Erik Poppe. *Norske Tannlaegeforen.Tid.* 67:165-168 April 1957

The doses employed for dental roentgenography have no harmful effect on the patient if the exposure is carried out properly. The smaller x-ray machines, operating at relatively low voltages, usually give higher skin doses than the larger machines. With the smaller machine there is less filtration and a shorter distance between the machine and the patient; the result is a greater proportion of soft roentgen rays.

The dose normally absorbed by the skin during an exposure is of the order of 5 to 20 r. One way to reduce the dose is to use fast film. Repeated exposures may be made, but in dentistry as in medicine the rule should be to avoid any unnecessary use of roentgen-ray radiation.

The tissues of a child are more sensitive to radiation than those of an adult, and this should restrain the dentist from making repeated exposures at a particular locus.

The effects of local irradiation, as from a dental x-ray machine applied to a small field, should not be confused with the effects of total body irradiation. Whereas a dose of 500 r applied to a 2 by 3 inch field causes temporary epilation and redness of the skin, the same dose given as total body irradiation would prove fatal to 50 per cent of the irradiated subjects.

The risk of exposure for the dentist or other person operating the x-ray machine is minimal if the apparatus is functioning properly. The dentist must never hold the film for the patient, as otherwise the dentist would be subject to unnecessary and cumulative exposure to the primary beam as well as to secondary radiation reflected from the patient. The operator should attempt to be as far as possible from the patient when making an exposure. So-called "x-ray mirrors" should never be used.

The genetic effects of radiation are cumulative over the period from infancy until the end of fertility. Any radiation-induced mutation may be assumed to be deleterious. The amount of radiation that reaches the gonads of a patient during dental roentgenography, however, is insignificant in the total accounting. Nevertheless, the use of a lead apron might give the patient an added feeling of security.

Det Norske Radiumhospital, Oslo, Norway

A simplified x-ray technique for the study of soft palate function in patients with poor speech

Peter Randall, A. Edward O'Hara and Frank P. Bakes. *Plast.& Reconstr.Surg.* 21:345-356 May 1958

A simplified technic for the study of soft palate function utilizes the equipment usually available in most hospital roentgenographic departments. Lateral roentgenograms are taken with the patient in the sitting position and phonating each of the following three sounds—"mmm," "sss" and "dah." With these three roentgenograms, it usually is possible to determine: the length, thickness and mobility of the soft palate; the relative depth of the nasopharynx; the position of the tongue; the presence or absence of adenoid tissue and of Passavant's bar, and the extent, if any, of velopharyngeal closure. All of this information is difficult to obtain without roentgenographic examination, and is even more difficult to record. The roentgenograms also show how the patient is using his soft palate when making these particular speech sounds. No contrast medium is used, the most satisfactory contrast being that between soft tissue and air.

Five case reports, with accompanying roentgenograms, illustrate the technic. The biggest source of error was found to be the taking of roentgenograms when the patient was not phonating the indicated sounds.

It is desirable for the roentgenographer to rehearse the test sounds with the patient before taking the roentgenograms.

The technic has been useful in confirming clinical impressions and in helping to decide on a course of therapy in patients with poor speech. Although the technic has been used chiefly in examining cleft palate patients postoperatively, it has been useful in other types of patients with speech problems. Progress during speech therapy and changes in the postoperative period can be recorded.

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A new cobalt 60 unit

Bo Lindell and Rune Walstam. *Acta radiol.* 45:236-248 March 1958

A recently introduced cobalt 60 unit, a modification of the "Radiumhemmet" teleradium unit, was tested at the Institute of Radiophysics and Radiumhemmet of the Karolinska Hospital, Stockholm, Sweden.

The unit, which emits telegamma rays, permits a wider variety of setups and a shorter treatment time. It was designed mainly for roentgenotherapy of deep tumors in the oral, abdominal and cranial cavities. It contains a rotating lead drum which gives at least 12 cm. of lead protection to the telegamma source (8.5 curie).

The radioactive source is moved into the tubular treatment head by rotating the channeled drum and directing it with wires. The source has the shape of a cylinder (6 mm. long and 6 mm. in diameter), and can be considered a point source, permitting taking off the beam from two different places on the treatment head. This permits multiple types of applications.

Distances used vary from 6 to 10 cm. skin-source distance. The amount of irradiation is 55 r per minute at the short skin-source distance, and 20 r per minute at the long skin-source distance.

The cobalt 60 unit gives a more uniform dose and a sharper edge to the treatment field than the teleradium unit (Radiumhemmet).

Although no clinical data are given, several successful tests have proved that the new cobalt 60 unit can be used for multiple field therapy of malignant lesions about the head, mouth and neck.

Institute of Radiophysics and Radiumhemmet, Karolinska Sjukhuset, Stockholm, Sweden

Parotid sialography: roentgenologico-surgical correlation in a series of 70 cases

Robert A. J. Einstein and Samuel L. Perzik. *California Med.* 88:98-102 Feb. 1958

The management of parotid tumors is hazardous and any diagnostic and therapeutic aid is desirable. Although sialography has been used since 1904 and many papers have been written on the subject, no attempt has yet been made to evaluate the procedure by correlating clinical, roentgenographic and surgical observations.

This is a report on 70 consecutive sialographic studies, in patients ranging in age from 14 to 79 years.

A contrast medium, between 0.5 and 1.5 cc. of chloriodized oil, is warmed to body temperature to lessen its viscosity, and injected into Stensen's duct through a blunt needle with a Luer-Lok syringe. The injection can be facilitated by pulling the cheek forward, thus straightening the duct. The injection is made with moderate pressure and the patient warned beforehand to expect some pain while the pressure is maintained. Local anesthesia of the duct opening or instillation of a small amount of an anesthetic agent into the duct does not lessen the slight, temporary discomfort. The optimal amount of contrast medium to be injected can be gauged by the backflow welling from Stensen's duct during the injection. The needle is then withdrawn and pressure is applied by means of a piece of gauze, held in position by the tightly closed jaws. Roentgenograms are taken immediately in the posteroanterior and lateral projections. Stereoscopic views, mainly in the posteroanterior projection, have been found most helpful. The entire procedure takes about 20 minutes. Swelling of the gland usually persists for a few hours and can be overcome by massage and gum chewing.

The normal parotid gland appears roentgenographically as a "winter tree" with evenly distributed branches gently tapering toward the pheriphery. A normal Stensen's duct is not more than 4 mm. in diameter. Abnormal findings can be grouped as: (1) intrinsic space-occupying lesions; (2) extrinsic indenting masses, and (3) abnormalities within the ductal system.

In the 70 patients for whom sialography was done, 36 space-occupying lesions were identified in the superficial lobe, 14 in the deep lobe, and three in accessory lobes. Two patients had diffusely infiltrating changes and nine had purely sialoangiectatic changes. In six patients the findings were considered "normal."

Fifty-eight patients were operated on for total or subtotal removal of the gland. The sialographic diagnosis proved correct in 50 of the 58 patients. In three patients in whom the sialographic diagnosis was deep lobe masses, tumors in the pterygoid portion were observed at operation. The tumors were bulky and had an "umbrella" effect. In four other patients, the neoplasm was judged roentgenographically to involve the pterygoid and inferior portions but at operation was found to be in the deep lobe. In one patient with a roentgenogram judged to be normal, a small, superficial lymph node within the substance of the gland was observed at operation.

The clinical impression—before sialography—also was correlated with the surgical findings. The clinical diagnosis was correct in 47 patients, incorrect in 11 patients. In all but one of the instances of incorrect clinical diagnosis, tumors which were actually situated in the deep lobe had been assumed to be located in the superficial lobe.

Sialography is of particular value in the differentiation between diseases of the parotid gland requiring surgical and nonsurgical treatment, and often prevents needless surgical exploration.

300 South Beverly Drive, Beverly Hills, California

Anatomic orientation points in dental roentgenography

Walther Müller. *Bl.Zahnhk.,Zürich* 19:75 May 1958

With the possible exception of oral surgery, no other field in dentistry requires such a thorough anatomic knowledge as dental roentgenography. To evaluate the full-mouth condition, a 14 film survey is required. Each successive film should overlap the last tooth presented by the previous film to ensure that each tooth or tooth part will be shown at least once throughout the survey.

It is seldom necessary to use more than 14 films. There are, of course, some exceptions when the dental arch is extremely narrow which makes it difficult to represent clearly more than one tooth at a time on the roentgenogram. Failure in establishing the anatomic orientation points frequently results in distorted tooth images on the outer edges of the roentgenogram. This occurs particularly in the anterior region, and in some instances it may be necessary to take pictures of each anterior tooth separately.

Even in taking roentgenograms of isolated regions of the oral cavity, the films should be placed either vertical or horizontal to the specified region. If a roentgenogram of the upper molar-bicuspid region is to be taken, the film should be placed with its long axis horizontal to obtain an anatomically correct picture. If an isolated roentgenogram of any of the anterior teeth is to be taken, the film should be placed with its long axis vertical to the tooth.

To make a complete periapical roentgenographic examination of all teeth, using 14 dental films, and taking the survey systematically, the operator should start at the upper molar region on the right side. Then he should work gradually to the upper left region; from there to the lower left molars and around to the lower right molars. Thereby, two pictures of each tooth are obtained from two different angles with the exception of the central incisors and the third molars. In roentgenograms of the upper central incisors, the shadowy appearance of accessory sinuses of the nose and the appearance of Y-shaped incisor foramens have to be considered. Both frequently cause erroneous interpretations. In roentgenograms of the upper cuspids, especially in obese patients, a shadow appears behind and beneath the alae nasi. This shadow is caused by folds of the mucosa and muscles. In roentgenograms of bicuspids and molars, two shadows represent the coronoid process of the lower jaw. These shadows are especially distinctive in roentgenograms of the upper third molars.

In roentgenograms of the lower jaw, misinterpretation seldom occurs. The mental foramen, however, may simulate the presence of a cyst. The linea obliqua often produces a shadow varying in form from a small line to a broad band. This shadow sometimes covers the most important parts of the third molars.

Roentgenographic examination of edentulous jaws is especially difficult because of the lack of anatomic orientation points. With resorption of the alevolar process, only the compact osseous parts of the jaws remain.

Familiarity with the anatomy of the teeth and jaws is a prerequisite for correct interpretation of roentgenograms. Lack of anatomic knowledge is frequently responsible for mistaking normal shadows for manifestations of disease. The general knowledge required for correct taking and interpreting of roentgenograms consists of the following: (1) normal anatomy and histology of the teeth and jaws with their anatomic variations; (2) special clinical and histopathologic experience, and (3) ability to recognize the various abnormalities produced by disease.

Römerhof, Zurich, Switzerland

Direct magnification of dental roentgenograms

E. A. Zimmer. *Fortschr.Röntgenstr.Nuklearmed.* 82:292-302 July 1958

To obtain direct magnification of dental roentgenograms, the technic of using a pinhole in lead, close to the central beam of a broad focus tube, has been employed frequently in the past. The pinhole acted as a newly created small focal spot. The disadvantage of the technic is the comparatively small amount of roentgen rays that were permitted to pass through the pinhole, thereby requiring long exposures.

The use of the Phillips 0.3 cm. focal spot tube has the advantage of decreasing the size of the source and permitting a larger amount of roentgen rays to pass through. Greater intensity in detail and the possibility of direct magnification of the image are obtained. Indistinct images are reduced to such an extent that in contact or short distance exposures—for instance in roentgenographic examinations of the temporomandibular joint—all structural details become sufficiently prominent to permit correct interpretation and direct magnification.

The closeness of the object to the tube, however, results in a comparatively high dosage; therefore, the use of a 7 cm. compression tube is recommended to prevent getting too close to the x-ray tube.

The sharpness of enlargements up to two and a half times normal is adequate. Decrease in sharpness at three (or more) times direct magnification, however, has been observed.

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Dosimetry in contact roentgenotherapy of malignant oral tumors: the Philips "Metalix" quantimeter

P. Marquès, A. Bru and M. Delpha. *J.radiol.èlectrol.* 37:170-172 March-April 1958

An accurate measurement of the difference in roentgen-ray distribution during contact roentgenotherapy of malignant oral tumors can be obtained by using a new dosimetric unit, the Philips "Metalix" tube quantimeter, operating at 50 kv., equipped with a Sievert microchamber.

Such a unit is employed at the Cancer Center of the University of Toulouse, France, to determine the optimum, maximum and minimum doses of radiation (organ tolerance dose) which can be administered without damage to normal tissues.

Two cases are reported. In the first case, hemangioma of the upper jaw, a horizontal, flat cone was used at port of entrance to evaluate differences in the roentgen ray dose distribution. In the second case, giant cell tumor of the lower jaw, a spherical cone depressing the facial skin was used.

By comparison of the dosimetric measurements it was established that when the depressing, spherical cone was used, a more homogeneous surface dose could be obtained.

It is suggested, therefore, that in contact roentgenotherapy (especially of malignant oral tumors) this technic should be employed whenever possible, not only because a more systematic and accurate determination of the roentgen ray dose to be administered safely can be made but also a better treatment result can be obtained.

Centre Anticancéreux, Toulouse, France

Histology

Electronmicroscopic examination of dentin of vital bicuspids to determine influence of certain drugs

Wolfgang Adolph. *Deut.zahnarztl.Zschr.* 13:816-825 July 15, 1958

Previous electronmicroscopic studies have revealed that in bicuspids of children, after cavity preparation, an increased number of interglobular regions indicates disturbances in the dentin. These disturbances were recognized in vital teeth.

To ascertain what factors were responsible for the observed failures of both cavity preparation and endodontic treatment, electronmicroscopic examinations were carried out at the department for conservative dentistry of the Dental College of the University of Tübingen, Germany.

A study was made of deciduous and permanent bicuspids, with healthy pulps and periodontiums, of children and adolescents. The enamel was detached and the dentin specimens decalcified and polished. The specimens were dehydrated and infiltrated in routine manner with various solutions frequently used in endodontic treatments and then embedded. After sectioning at from 20 to 30 microns in thickness, and staining, the specimens were prepared for electronmicroscopy. Diamond burs, operating at 25,000 rpm, were used.

The influence of the following drugs was investigated: methylene chloride, alcohol (95 per cent), hydrogen peroxide (3 per cent), chloramine (2.5 per cent), iodine alcohol (5 per cent) and bismuth phenolate combined with menthol.

The electronmicroscopic studies of the photomicrograms revealed that all the drugs investigated exerted an unfavorable influence on the dentin, especially observable in the dentinal tubules which contain the protoplasmic processes of the odontoblasts and in the surrounding matrix

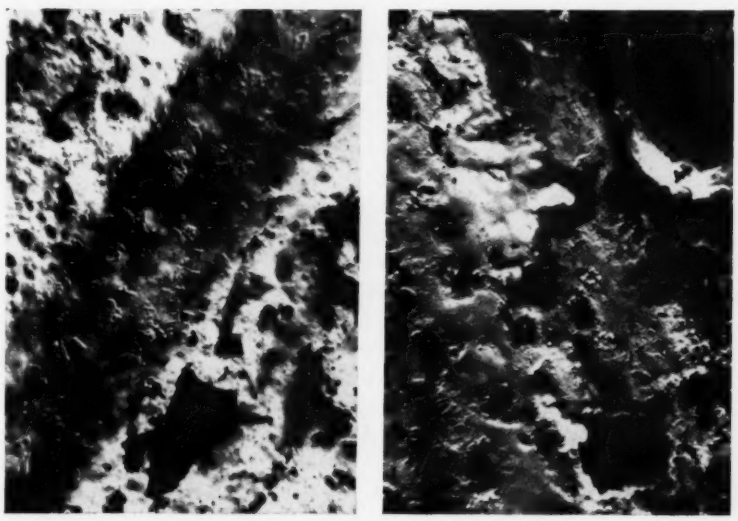

Figure 1 Left: Changes in dentin caused by iodine alcohol (5 per cent). Right: Changes in dentin caused by bismuth phenolate combined with methol

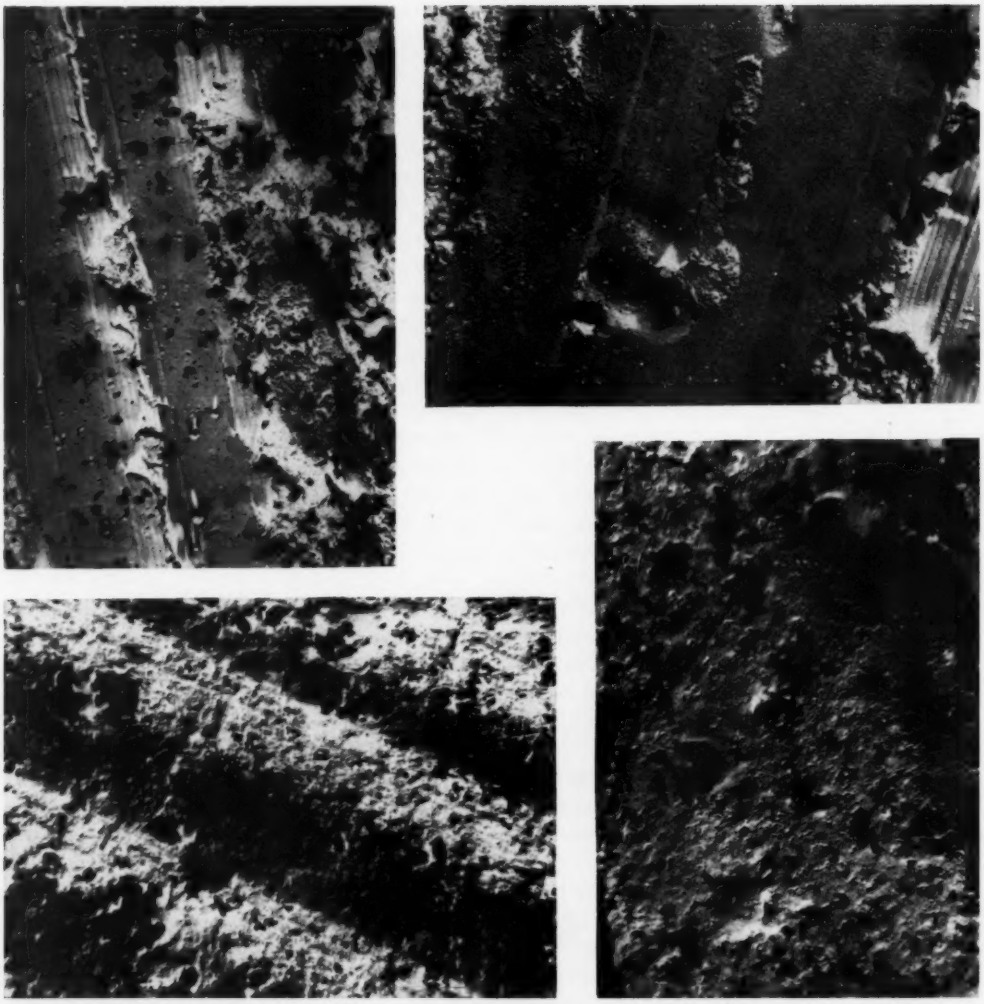

Figure 2 Above left: Changes in the dentin of a vital bicuspid treated with methylene chloride. Above right: Changes in dentin caused by alcohol (95 per cent). Below left: Changes in dentin caused by hydrogen peroxide (3 per cent). Below right: Changes in dentin caused by chloramine (2.5 per cent)

which consists of vacuoles, ground substances and collagenous fibrils. Changes in the dentin, which explained the failure to calcify normally, were observed.

The histochemical changes occurring in dentin infiltrated with solutions of various drugs were similar to those which were previously established in the dentin of incisors of experimental animals.

Clinicumgasse 12, Tübingen, Germany

A desquamative cytological study of the gingivae and oral mucosae in women

J. R. Trott, *J.Periodont.* 29:213-216 July 1958

A desquamative cytological study of the gingiva and oral mucosa in 11 normal women ranging in age from 19 to 28 years old was made during a number of consecutive menstrual cycles.

No evidence was found of any cyclical changes in the degree of keratinization in the oral mucosa.

(Cyclical changes do occur in the hornification of the vaginal epithelium.)

Continual changes in the pattern of keratinization in the oral mucosa occur, but probably are due more to the functional stimuli of saliva and food than to estrogenic factors.

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Electron microscopy of the epithelial lining of the human oral mucosa

Reidar F. Sognnaes and John T. Albright.
Oral Surg.,Oral Med.& Oral Path. 11:662-673
June 1958

Electron miscroscopic observations were made on the squamous epithelium lining of human oral mucosa with a view to exploring the ultrastructural changes associated with the partial keratinization and the total desquamation processes characteristic of this tissue. The keratohyaline granules appear to possess an inherent electron density demonstrable not only in material fixed in osmium but in that fixed in Formalin. These granules are scattered widely through the cytoplasm of normal epithelial cells from the intermediary and superficial layers of human oral epithelium.

The keratohyaline granules appear to arise in association with (1) certain foldings of the nuclear membrane, (2) nucleolar fragmentations and formation of nucleolar satellites migrating to the nucleolar surface, and (3) the formation of cytoplasmic complexes near the nuclei containing granules of various dimensions and mitochondrial fragments besides the high-density keratohyaline granules.

Certain ultrastructural changes in the peripheral cell membranes are characterized by a great increase in total cell surface and by the development of deep foldings of the cell membrane interdigitating with grooves in adjacent cells. Although the deeper cells appeared to be held together by a relatively dense cementing substance, the superficial cells separated more readily and had little or no intercellular cementing substance between them.

Harvard School of Dental Medicine, Boston, Mass.

Dental structure and caries. An introduction

Gösta Gustafson. *ORCA* 4:114-122 1957
[in English]

Every year new theories on dental caries are advanced. Some are fantastic and others are reasonable; all must be examined in the light of existing knowledge of the structure of the enamel.

Recent investigations with the electronic microscope reveal that the organic part of the enamel consists of fine fibrils, densely packed in the prism sheaths and loosely packed in the interior of the prisms and in the interprismatic substance. Between the loosely packed fibrils are spaces. It is in these spaces that the inorganic part of the enamel is precipitated in the form of submicroscopic crystallites. The crystallites are oriented with their long axes parallel to the long axes of the prisms. Only the meshes in the interior of the prisms and in the interprismatic substances are filled with crystallites in normal enamel. The prism sheaths normally are not mineralized but they can become so during certain stages of caries development.

It is not known whether there is any connection between the crystallites and the fibrils. Research on this matter may reveal important facts. Research on the formation of fibrils and on mineralization is important, as it is at this stage of development that the linkage between organic and inorganic substances will be established.

As far as can be seen now, there are no components in the enamel other than the fibrils and crystallites. All the changes which take place in these should be investigated. It is important to know what happens during the carious attack. Examination of early carious lesions of enamel may point the way for future research. The problems can be illustrated with the aid of two relatively simple methods, namely, microhardness tests and polarized light.

One important question to answer is which of the two enamel components, the organic or the inorganic, is attacked first. Investigations in polarized light indicate the region in which the first changes in the organic components take place.

The final destruction in a carious lesion starts underneath an unbroken surface with a formation of a cavity. Many possible explanations have been advanced for this phenomenon. Researchers still do not have enough information to decide which of these theories is the right one. Histological investigations provide a control on caries theories.

It is the enamel that must be influenced with prophylactic measures. The problems associated with caries prophylaxis will not be resolved if the dentist does not know what he wants to influence and how to do it. Unless a reasonable knowledge is attained, it will never be certain that the best and simplest way has been chosen.

Tandläkarhögskolan Malmö, Sweden

Nuclear changes in oral epithelial cells in subacute combined degeneration of the spinal cord due to vitamin B_{12} deficiency

S. T. Boen, J. A. Molhuysen and J. Steenbergen. *Lancet* No. 7041:294-296 Aug. 9, 1958

Boen in 1957 described nuclear changes in oral epithelial cells in patients with pernicious anemia. In association with pronounced nuclear polymorphism, the presence of giant nuclei was characteristic. The nuclei were more or less round and had a finely reticulate chromatin structure. The greatest diameter was above normal, on the average. The question arose whether the nuclear changes also would be found in those rare instances in which vitamin B_{12} deficiency is manifested by neurological disorders without changes in the blood. Recently, such a patient was studied by the authors.

A 57 year old woman had had subacute combined degeneration of the spinal cord for several months, but showed no changes in the blood or bone marrow. The diagnosis of vitamin B_{12} deficiency was made on characteristic nuclear changes in the oral epithelium.

The test is made as follows: The patient is asked to rinse his mouth thoroughly three times with physiologic saline solution so as to remove food remnants. The mouth then is washed twice again, and the material thus obtained is centrifuged for about ten minutes at 1,000 rpm. The sediment is smeared evenly on microscope slides and stained with May-Grünwald-Giemsa stain. A hundred consecutive nuclei are measured in their greatest diameter, using an oil immersion objective.

Normally, a maximum of 5 per cent of the nuclei have diameters of 14.5 microns or more; in seven of ten patients with pernicious anemia, the nuclei were definitely abnormal, 26 per cent having diameters of 14.5 microns or more.

In the afore-mentioned patient, 19 per cent of the nuclei had a diameter of at least 14.5 microns.

A diagnosis of vitamin B_{12} deficiency was made on these changes in the epithelial cells of the mouth, and the patient was treated with daily intramuscular injections of vitamin B_{12} for three weeks, and thereafter weekly. Her legs gradually grew stronger and after a month she could walk short distances without support. The paresthesia, the numbness and the abnormal reflexes disappeared. The oral epithelial cells were normal again a week after the beginning of treatment. No changes were seen in the hemoglobin concentration, reticulocyte counts or serum-iron level.

The characteristic changes in the nuclei of the oral epithelium appear to be evidence of vitamin B_{12} deficiency. Detection of the changes is easy and the method is suitable for clinical purposes.

University Clinic of Internal Medicine, Binnengasthuis, Amsterdam, The Netherlands

A study of the bacterial flora of the gingiva in various periodontal diseases

Steen Børglum Jensen. *Tandlaegebl.* 62:9-30 Jan. 1958

Several studies have been made to determine which bacteria are involved in the development of pathologic processes in the gingival margins in patients with periodontal disease, but the evidence so far presented is insufficient to clarify the etiology of periodontal disease.

In the present study, the bacterial flora of the gingival margins of 100 patients was examined by a method described by Gins (1941) and the results were compared with those obtained from 25 patients with clinically normal gingiva. A thin, transparent strip of plastic material (Styroflex) is pressed against the gingival area to be examined. On its removal, bacteria and epithelial cells adhere to the strip which is then stained with methylrosaniline chloride (gentian violet). Microscopic examination establishes the location, density and types of microorganisms involved.

To minimize the effect of local variations in the flora, five sets of data, including qualitative and quantitative evaluations, were obtained in the marginal area and also in the area of the attached gingiva. Numerical data for the various types of bacteria found in these two areas are given as the average of the five determinations of each.

Four clinical types of periodontal disease were represented: acute necrotizing gingivitis, simple marginal gingivitis, chronic ulcerative gingivitis, and periodontitis.

The bacterial flora of the attached gingiva was found to be constant in all groups of periodontal diseases. The dominating microorganisms were gram-positive cocci. The flora of the gingival margins showed greater variation. Compared to the flora of normal gingiva, the marginal flora in periodontal disease is characterized by a denser population of microorganisms, and by different types suggesting an increased anaerobic flora of spirochetes, fusiforms, vibrios and cocci. The proportions of these organisms in different periodontal diseases are given in tables and graphs.

In acute necrotizing gingivitis, the spirochetes are the dominant organisms. Their relative incidence decreases in periodontitis and in marginal gingivitis; in samples from normal gingiva, the spirochetes are rare or are absent.

On the basis of bacteriological findings alone, it has not been possible to distinguish between the clinical forms of periodontal disease, but the presence of oral spirochetes may be a significant factor in deciding the degree of periodontal inflammation. It also appears likely that an evaluation of the occurrence of spirochetes may give a clue to the prognosis.

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Incidence of gingivitis as related to sex, occupation, tobacco consumption, toothbrushing, and age

Arnulf Arno, Jens Waerhaug, Arne Lovdal and Olav Schel. *Oral Surg.,Oral Med.& Oral Path.* 11:587-595 June 1958

An examination to determine the incidence of gingivitis as related to sex, occupation, tobacco consumption, oral hygiene and age was carried out on the employees of a modern manufacturing company in Oslo. The employees consisted of 1,096 men and 250 women, of whom 741 were workers and 605 were staff members. The following conclusions were drawn:

1. There seems to be no sex difference in the susceptibility to gingivitis. Any difference in the incidence of gingivitis in men and women may be attributed to a difference in local factors, such as tobacco consumption or oral hygiene.

2. There seems to be no difference in the susceptibility to gingivitis between workers and staff members. The higher incidence of gingivitis

among the workers may be attributed to the poorer oral hygiene rather than to environmental factors.

3. Tobacco consumption seems to be an etiologic factor in gingivitis.

4. The incidence of healthy gingival units obviously is related to the efficiency of toothbrushing, but toothbrushing does not noticeably improve the condition of the gingiva in the interproximal spaces.

5. The incidence of gingivitis increases with advancing age.

Norwegian Institute of Dental Research, Oslo, Norway

Response of periodontal tissues to intraoral injections of somatotropic hormone in young adult male rats

S. S. Stahl and O. Joly. *Oral Surg., Oral Med. & Oral Path.* 11:475-483 May 1958

Somatotropic hormone (STH) has been shown to have a stimulating effect on oral structures.

Twenty-nine male rats of the Long-Evans strain, weighing an average of 225 Gm. at the beginning of the experiment, were divided into three groups. In 15 rats 0.5 mg. of STH in 0.1 cc. of distilled water, buffered to a pH of about 10, was injected into the mucobuccal fold three times weekly for six weeks. Nine control animals received buffered distilled water injections in the same manner. Five animals served as untreated controls. At the end of the experimental period, the maxillae and femurs were dissected and studied histologically. It was noted that:

1. The rats treated with somatotropic hormone showed an increase in endosteal alveolar bone deposition. Increased osteogenic activity, although of a lesser magnitude than seen endosteally, was observed on the periodontal surfaces of the alveolar bone. The newly formed bone contained few cells and appeared poorly organized.

2. An increase in cementum formation and cellularity of the periodontal membrane occurred.

3. The epiphysial cartilage of the femur of the rats treated with hormone appeared wider and showed an increase in chondrogenic activity when compared with the control specimens.

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Age changes in the periodontium

Clifton O. Dummett. *Mil.Med.* 123:131-135 Aug. 1958

The most striking and spectacular oral changes which accompany old age are loss of the teeth with the resultant reduction in intermaxillary dimensions, and an increase in prominence of the chin.

Present knowledge about age changes in the tissues of the periodontium is not voluminous. Dummett (1949) discussed the probability of an increase in gingival color with age. Gottlieb (1921) theorized that with increasing age the epithelial attachment proliferated downward from the enamel until it was entirely on the cementum, and continued to proliferate apically throughout life. This was disputed by Orban (1957). A loss of stippling of the gingival surface with a resultant edematous appearance has been observed as a manifestation of age. The thinning or absence of a keratinized layer on the gingivae as a specific result of aging has been proclaimed but not substantiated.

As to age changes in gingival architecture, it has been observed that the apical downgrowth of the epithelial attachment is accompanied by an abbreviation and a rounding of the interdental gingivae. Specifically, the gingivae, epithelial attachment and alveolar bone move with uniformly deliberate speed, devoid of clinical inflammatory signs and pocket formation. Chronic irritation of the gingivae in the aged usually results in atrophy and recession.

Among the structural changes in the periodontal membrane which have been listed as a result of aging are the reduction in prominence of the principal fibers consequent to a reduction in function, and the occurrence of cementicles in the periodontal membrane. Kronfeld (1936) stated that age had no noticeable effect on the thickness of periodontal membrane. Coolidge (1937) presented data which indicated that a reduction in the width of the periodontal membrane is asso-

ciated with age. The attribution of specific changes in the periodontal membrane solely to age is subject to question.

Cancellous bone may be affected by metabolic influences and by aging. Under such conditions as old age, lack of function, nutritional deficiencies or hormonal dysfunctions, this bone may develop osteoporosis.

The margins of the alveolar bone are altered with advancing age. As a result of the mesial drift of teeth and associated interproximal contact attrition, bone resorption tends to occur on the mesial surface and bone apposition appears on the distal surface of the alveolus. Osteocytes lose their vitality with advancing age.

Cementum is deposited slowly and continuously throughout life, and may be either primary or secondary. Thoma and Goldman (1939) asserted that secondary cementogenesis compensates for the continuous eruptive movements of the functioning tooth and the continuous reorganization of the periodontal membrane necessitated by these movements. Although confined to the apical third in young teeth, secondary cementum extends more toward the cementoenamel junction with advancing age. It is probable that the thickening of the cementum with advancing age and the simultaneous resorption of alveolar bone prevent the thickening of the periodontal membrane.

Information is lacking about many aspects of age changes in the periodontium. It is logical that the periodontal tissues, like any other tissues, have their own time curve of aging which depends on heredity, internal environment and oral environment. Commonly held concepts need to be reexamined.

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Changes in the periodontium of rat molars occurring after hypophysectomy

A. Krönke. *Deut.zahnärztl.Zschr.* 13:665-671 June 1, 1958

The theory that all endocrine glands are closely interrelated suggests that by removal of the hypophysis the function of the other endocrine glands, especially of the parathyroid glands, is disturbed. These glands play an important part in the calcium metabolism which regulates the tooth development and the calcification process. It can be assumed, therefore, that experimental removal of the hypophysis produces disturbances in the tooth development and structural changes in the periodontium.

The effect of hypophysectomy on the periodontium of rat molars was studied in 120 female white rats of different, undefinable strains at the Dental School of the University of Hamburg, Germany. Twenty rats of the same sex and color served as a control group.

The diet, before and after hypophysectomy, consisted of milk-soaked white bread, various cereals, lettuce and carrots to which pieces of meat were added occasionally.

None of the rats showed signs of hypophysial deficiency prior to the operation. Hypophysectomy was performed by the parapharyngeal approach (Smith's method). The animals were killed in groups of 20 each, from 1 to 180 days after the operation.

Dentin and enamel of the still growing incisors showed disturbance in the calcification after a few days. Histologically observable changes in the marginal periodontium of the molars, however, occurred from three to four weeks after the operation.

The clinical findings were as follows: retarded eruption, decrease in the length of the roots, increase in the dimensions of pulp chamber, pulp canals and apical foramens. The main histologic findings were severe disturbances in the calcification process and the vascular distribution. There were also pyknosis of cell nuclei, diminution of blood and nutrient vessels and resorption of periodontal tissue, especially of the alveolar bone. All these changes were progressive. The actual alterations in each experimental animal varied, depending on the time elapsed between hypophysectomy and sacrifice.

The inflammatory, degenerative and destructive changes in the rat molars after hypophysectomy resembled the symptoms of periodontal disease. Loss or deficiency of hypophysial function, therefore, should be considered as an endogenous factor in the pathogenesis of periodontal disease.

Martinistrasse 52, Hamburg 20, Germany

Anesthesia and analgesia

Dental anaesthesia

Brit.M.J. No. 5091:308 Aug. 2, 1958

One of the subjects discussed by the section of anesthetics of the British Medical Association at its 1958 annual meeting was dental anesthesia. R. E. Lee, discussing the use of nitrous oxide for anesthesia in the dental office, described a combination of controlled asphyxia, some analgesia and a great deal of hypnotic suggestion. The main virtue of this method was quick recovery. The fact that mortality rates were low was a tribute to the anesthetist rather than to the method. To avoid risks, he suggested a greater use of supplemental drugs, an adequate supply of oxygen, analgesia, a more careful psychological approach to the patient, and restriction of the extent of dental operations carried out in the chair.

D. S. Young said that intravenous agents in dentistry might be used in four ways: complete general anesthesia with muscle relaxants and a nasotracheal tube might be chosen for major surgery and conservative work; the use of an intravenous agent might be followed by nasopharyngeal intubation and nitrous oxide, but without relaxants; intravenous agents could be the sole anesthetics used; or they could be used for induction before continuing with nitrous oxide and oxygen, with or without supplemental agents. An intravenous anesthetic agent has an immediate advantage over nitrous oxide in allowing a more pleasant induction, greater control of the patient and therefore better operating conditions, and the avoidance of anoxia. If these methods were to be used, however, the practitioner administering the anesthetic needs even greater training than is required for nitrous oxide anesthesia. Dr. Young recommended the addition of atropine to thiopental sodium, to reduce secretions and the incidence of laryngeal spasm. Intravenous anesthesia is particularly suitable for multiple extractions, resistant subjects, extremely difficult operations, and patients who explicitly request it. However, a careful selection of patients is essential; asthmatic and bronchitic subjects should be anesthetized under hospital conditions.

Professor R. F. Woolmer stressed the difficulties in training dental and medical practitioners in the art of dental anesthesia. Professor W. W. Mushin suggested that the addition of atropine to thiopental sodium did not prevent laryngeal spasm *per se*, but only as a secondary effect after the reduction of secretions, and that the training of dentists in anesthesia should be done at the postgraduate and not the undergraduate level.

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Prevention of fatal aspiration during anesthesia

W. Hügin. *Deut.med.Wschr.* 82:2213-2215 Dec. 27, 1957

Aspiration of the contents of the stomach occurs frequently in the course of an operation when the patient is under general anesthesia. Although it is technically not difficult to prevent such an aspiration, it is not easy to carry out consistently all the precautionary measures required.

Brief inhalation anesthesia requires the same thorough preparation as does prolonged and deep anesthesia. Prior to any surgical intervention to be performed under anesthesia, it is advisable to give the patient only soup as the evening meal. Water or tea may be taken until midnight; after that time any further intake is prohibited.

Before anesthesia, the patient's stomach should

be emptied by the intravenous administration of apomorphine hydrochloride, an emetic to which the vomiting center promptly reacts. The initial dose is 2 mg., and a second injection of 1 or 2 mg. should be given when the vomiting starts.

Aspiration of gastric juice with the aid of an "indwelling" tube is especially advisable if only fluid or pulpy contents of the stomach can be expected.

In patients in whom emptying of the stomach by vomiting is contraindicated, occlusion of the cardia with the aid of a balloon tube is a reliable method for prevention of aspiration during anesthesia. Gastric lavage cannot be recommended because portions of the irrigation fluid and food residues may remain in the stomach.

If vomiting occurs during anesthesia without endotracheal intubation, the patient's head should be lowered immediately and suction with a wide-lumen catheter should be initiated. If necessary, the suction can be performed with the suction tube directly attached to one nostril while the other nostril is kept closed.

Two cases of fatal aspiration during anesthesia are reported.

Bürgerspital, Basel, Switzerland

Incorporation of ethyl aminobenzoate into an aqueous formulation for a dental lotion

Benjamin F. Allen and Phillip J. Levine.
J.Am.Pharm.A. (Prac.Pharm.Ed.) 19:154-155
March 1958

The incorporation of ethyl aminobenzoate into a lotion provides an aqueous medium designed to supplement the anesthetic properties of the drug. Such a form of medication is capable of suspending large concentrations of the drug, to provide maximum topical anesthesia for use in minor oral surgery.

Although ethyl aminobenzoate has been used in ointments, such vehicles, because of their basic unctuous nature, may retard onset of action and delay penetration. Less massage is necessary for the application of a lotion, and less residue is left on the surface.

Several lotion bases were formulated. The lotion products were prepared by placing 20 Gm. of finely powdered ethyl aminobenzoate in a mortar. The base was added in small quantities with thorough trituration. Each lotion then was milled by passing it through an Eppenbach Colloid Mill, at a setting of about 1:20,000 inch.

The following three formulations produced the most satisfactory results:

Base A: methylcellulose (4,000 centipoises), 2.00 Gm.; methylparaben, 0.15 Gm., and purified water in sufficient quantity to make 100.00 Gm.

Base E: polyethylene glycol 400, 87.50 Gm.; dioctyl sodium sulfosuccinate, 0.15 Gm.; methylparaben, 0.15 Gm., and purified water in sufficient quantity to make 100.00 Gm.

Base G: glyceryl monostearate, nonemulsifying, 5.30 Gm.; glycerin, 2.00 Gm.; sodium lauryl sulfate, 0.75 Gm., and purified water in sufficient quantity to make 100.00 Gm.

No clinical tests were performed; preliminary determinations of anesthesia were made on the rabbit cornea.

None of the lotions caused irritation. Base A had a pH of 2.8 and produced 44 minutes of anesthesia. Base E had an irregular pH and produced 53 minutes of anesthesia. Base G was considered the best of these lotions. It had a pH of 6.8, close to that of normal human mucous membrane. The lotion permitted 93 minutes of corneal anesthesia.

Further studies are planned to compare the anesthetic effects of the ointments with those of the lotion formulations.

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Pathology

Histopathology of oral pseudotumors: epulis granulomatosum and mycosis fungoides

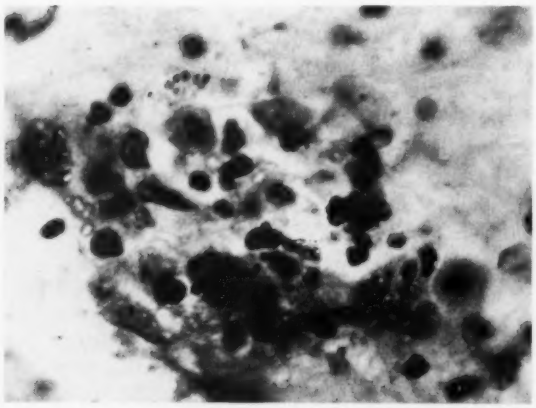
Fritz Brosch. *Zahn Mund Kieferhk.* 28:185-199 March 1958

Neither the epulis granulomatosum nor the mycosis fungoides is a true tumor. Predisposing factors of such an inflammatory overgrowth are certain forms of local mechanical irritations caused by calculus accumulations, carious lesions producing sharp edges, overhanging fillings and trauma caused by poorly fitting dentures or anatomic conditions such as close bite.

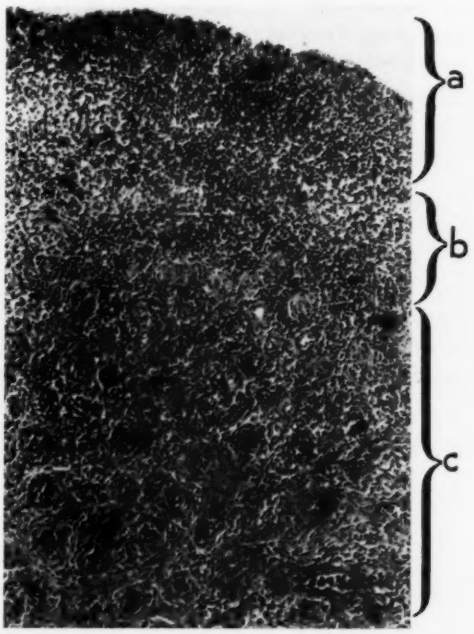
Histopathologic examination of specimens taken from epulis granulomatosum arising on the alveolar process reveals a well-defined mutation of stratified squamous cells in the epithelial surface. In larger varieties, there exists a keratinized stratum. In the rete mucosa edematous changes are observable. Papillary processes extend into underlying connective tissue. The epithelial layers are thickened, and between the layers isolated islands are formed as a result of pathologic irregularities of the neoplastic growth.

The mass of this pseudotumor consists of elongated layers of loosely arranged mature fibrous tissue. Inflammatory plasma cells and small leukocytes are present beneath the epithelium, around blood vessels or within the layers of granulated fibers. Granulation tissue growing from a poorly healed extraction wound, a remaining chip from bone or tooth or a comparatively small primary sequestrum may produce a pedunculated hyperplasia of the gingival tissue that initially shows the symptoms of a malignant central tumor extruding from the alveolus. Areolar hyperplasia is often blamed on poorly constructed dentures when actually a postinsertion atrophy of the alveoli producing a pseudotumor had been the cause of the poorly fitting denture.

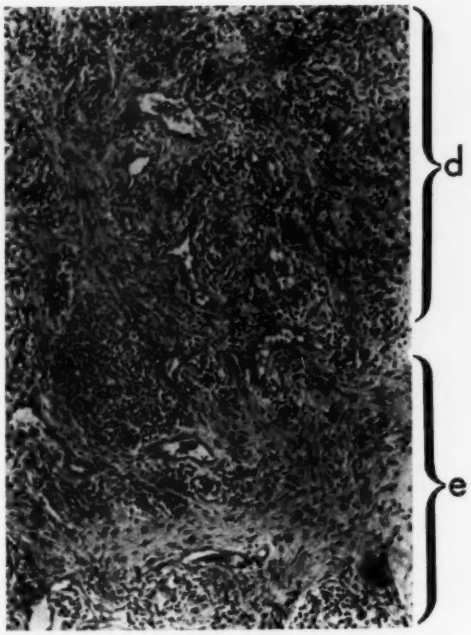
Epulis granulomatosum or epulis fibromatosa are often caused by the suction action of dentures,

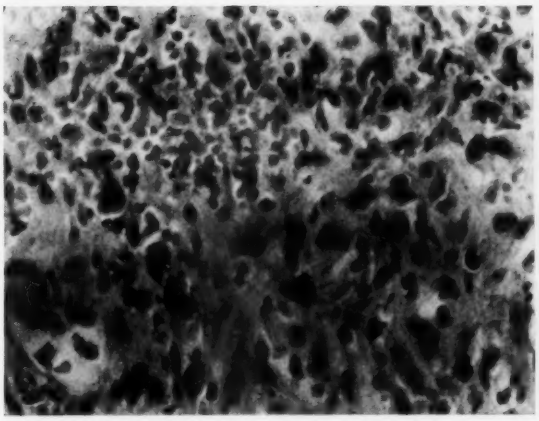


Above: Epulis granulomatosum. Resorption center, accumulation of erythrocytes surrounded by hyperplastic reticular nuclei and eosinophilic granulocytes



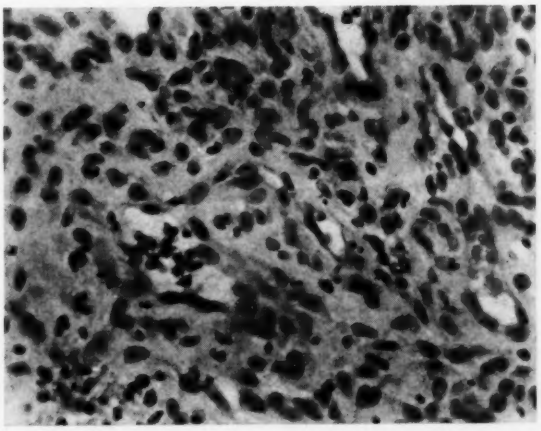
Right: So-called spindle cell sarcoma. a = granulated tissue. b = extravasated blood. c = vascular bundles





Above: Enlargement of the zone of extravasated blood. In the background, accumulation of erythrocytes infiltrated by leukocytes and hyperplastic histiocytes

Left: Transition from spindle cell sarcoma to giant cell tumor. d = infiltration zone of spindle cells. e = infiltration zone of giant cells



Developing spindle cell sarcoma. Spindle cells gradually replacing reticular cells, histiocytes and leukocytes. Newly formed cells begin to show their characteristic spindle-shaped form. No giant cells present

by biting the cheek or the tongue during mastication or by drawing parts of the oral mucosa into an edentulous space to improve suction.

Degenerative changes, apart from inflammation, are rare. If they occur they result from surface abrasion caused by calculus, cervical caries or faulty dentures. A close bite, however, may cause such degenerative changes. Occasionally, the granulated strands appear coarse and disconnected. In typical epulis granulomatosum, as opposed to fibroma or giant cell epulis, mineralization or ossification is seldom observed.

Mycosis fungoides (granuloma sarcomatodes), often developing as the result of an acute localized periodontitis which remained untreated or was not completely healed, shows a gradual change to a chronic condition by alterations in the type of cells present in the neoplastic mass.

Polymorphonuclear leukocytes, the predominant cells indicating an acute inflammation, are gradually reduced in number and replaced by lymphocytes and plasma cells. Eczematoid regions, cell infiltrations, nodules, reddish tumorlike growths and ulcerations are the characteristics of this disease.

The so-called spindle cell sarcoma, however, seems to be only a transitional condition leading to giant cell tumor (osteoclastoma) which is a true tumor.

In some instances the oral pseudotumors may be acellular except for a few isolated fibroblasts and an insignificant perivascular inflammatory infiltration of plasma cells.

Treatment of oral pseudotumors consists of surgical removal of the benign neoplasms and elimination of the factors causing the continued irritation.

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Bitterness in the mouth

J.A.M.A. 168:136 Sept. 6, 1958

Q.—A 57 year old man complains of a strong taste of bitterness in his mouth and throat all the time regardless of what he may eat or drink or the kind of work he may do. This sensation began after his tonsils were removed Feb. 7, 1958. Findings on all examinations have been essentially negative. The only thing found was a fairly large hiatus hernia. Is it possible that there could be a regurgitation of digestive fluids or bile which would cause the taste of bitterness in the mouth? What else might cause this disagreeable sensation?

A.—The complaint of "bitterness in the mouth and throat" is not uncommon. There are probably many causes, but in most instances the condition is of a functional nature, related to aerophagy, dietary habits, poor elimination, and inadequate dental care; at times there is an associated compulsive neurosis. The possibility of regurgitant esophagitis associated with an esophageal hiatus hernia could receive consideration. Esophagoscopy and roentgenologic examination should help to determine this. It is unlikely that repair of such a hernia will eliminate this symptom. Rarely is the actual cause of this unpleasant symptom found.

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Injuries to the inferior dental and mental nerves

H. E. Simpson. *J.Oral Surg.* 16:300-305 July 1958

Injuries to the inferior dental and mental nerves are fairly frequent complications of accidental trauma or operative procedures involving the mandible.

Although the inferior dental nerve is enclosed in a bony canal, the bone itself is prone to trauma. The commonest causes of injury to this nerve are the surgical removal of teeth or roots, and fractures of the mandible. The tooth primarily concerned is the third molar. Damage to the nerve may occur in two ways during removal of the third molar. First, if it is necessary to elevate root apexes or otherwise use instruments in the region of the root tips, the nerve may be crushed or cut. Second, the relation of the roots to the nerve and the other contents of the canal may be such that injury cannot be avoided.

Injury to the mental nerve usually is caused by the removal of unerupted teeth or roots in the bicuspid region. The mental foramen is unfortunately situated for such procedures, and the mental nerve is exposed to damage either by instrumentation within the bone or during the re-

flection of mucoperiosteal flaps. Lacerations of the lip caused by extraoral trauma can produce injury to the mental nerve similar to that caused by incisions for intraoral operations.

The principal sign of injury to the inferior dental and mental nerves is anesthesia or paresthesia of the lower lip and chin. Complete anesthesia is seldom permanent but occasionally persists for several months.

In an attempt to assess the progress of injuries to the inferior dental and mental nerves, 50 patients who suffered from these conditions and who had been kept under observation for at least six months or until recovery took place, were chosen at random and studied. The following conclusions were reached:

1. Not less than 50 per cent of patients suffering from injuries to the inferior alveolar and mental nerve can be expected to recover in 11 weeks.

2. The possibility of spontaneous recovery after six months is slight.

3. Injuries resulting from third molar operations recover much less satisfactorily than those resulting from fractures of the mandible or from bicuspid operations.

Sutherland Dental School, Newcastle upon Tyne, England

Mandibular dysostosis (Treacher Collins syndrome)

Edward J. Pavsek. *Am.J.Roentg.* 79:598-602 April 1958

The syndrome of mandibulofacial dysostosis concerns itself with an unusual and apparently closely related group of congenital defects of the head and face. The syndrome is of interest to the oral surgeon, ophthalmologist, otolaryngologist and maxillofacial surgeon.

Franceschetti and Klein (1949) listed the following important clinical signs common to all classic cases of mandibulofacial dysostosis in its complete form: (1) antimongoloid palpebral fissures with a coloboma of the outer portion of each lower lid, and deficiency of the eyelashes; (2) hypoplasia of the facial bones, especially of the malar bones and the mandible; (3) malformation of the external ear, and occasionally of the middle and internal ears; (4) macrostomia, high palate (sometimes cleft) and abnormal position and malocclusion of the teeth; (5) blind fistulas between the angles of the ears and the angles of the mouth; (6) atypical hair growth in the form of a tongue-shaped process of the hairline extending towards the cheeks, and (7) other anomalies such as facial clefts and skeletal deformities.

A case is presented, with most of the classic features, including a moderately recessive chin, a malar eminence that was deficient bilaterally, a small mouth, a high palate but no cleft, and underdeveloped malar bones and maxillary sinuses.

The 52 year old patient remarked that she had been aware of her peculiar "bird-face" appearance ever since she was a youngster, and that she was deaf in her right ear from birth.

A review of the embryology of the skull and face reveals retardation or failure of differentiation of maxillary mesoderm at and after the second month of fetal life.

Hospital of the University of Pennsylvania, Philadelphia, Pa.

Palatal and facial growth in Macaca rhesus monkeys with surgically produced palatal clefts

Bernard G. Sarnat. *Plast.& Reconstr.Surg.* 22:29-41 July 1958

The purpose of this experiment was to determine the effects on palatal and facial growth of (1) unilateral removal of the oral mucoperiosteum and ligation of the descending palatine artery in order to decrease the blood supply, and (2) unilateral resection of the hard palate to eliminate the median palatine and transverse palatine sutures as possible growth sites.

Seven young, growing *Macaca rhesus* monkeys were operated on. The postoperative survival ranged from 1 to 34 months. Seven normal monkeys which were not operated on served as controls.

A smooth, thinner epithelial scar, in contrast to the thicker normal mucoperiosteum with its palatal rugae, covered the operative site in varying amounts. In every instance, the soft tissue

covered a greater area of the palatal defect than the bone.

In two animals in which only the mucoperiosteum was removed and the descending palatine artery ligated, extensive defects were found in the hard palate and in the covering soft tissue. In those animals in which, in addition, the bony palate was resected, the surgical cleft of the hard palate persisted in varying degrees. No correlation was made between the extent of the palatal surgery or the length of postoperative survival, on the one hand, and the extent of the palatal cleft.

A comparison of the sides operated on with those not operated on, and of the skulls of animals on which surgery was performed with approximately comparable controls, revealed no significant gross differences in growth and development of the hard palate, dental arches, maxillomandibular relationship (arch size and form, occlusion and tooth relationship) or total face.

Within the limits of this experiment it is concluded that unilateral traumatic surgery in the forms used did not produce in either the palate or the face an arrest in growth which was grossly apparent. This experiment suggests that the surgical trauma incident to the raising of mucoperiosteal palatal flaps is not the cause of lack of maxillary and facial growth by the production of either a sutural growth arrest or decreased blood supply to the region.

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Progressive intradental resorption: an analysis of an unusual case of external resorption

F. H. Lepp. *Cien.y Cultura* 2:113-132
April-June 1957

An interesting example of external resorption came to the author's attention during a routine study of dental roentgenograms. Nothing was known about the age or sex of the patient, nor was any information available in regard to clinical symptoms. The roentgenogram showed an upper lateral incisor containing a polygonal cavity with definite outlines in the medial third of the root, close to the neck. Through the radiolucent area, which had no apparent communication with the marginal periodontium, the clearly distinguishable outlines of the root canal were observable. The tooth was not affected by caries, but extensive destruction of the alveolar bone could be detected in the marginal and periapical region (marginal and periapical periodontitis).

On examination, the surface of the tooth (which had been extracted and which was fortunately available for study) was found unchanged except for a small circumscribed cavity on the vestibular or labial aspect of the root 5 or 6 mm. below the cementoenamel junction. The outlines of the cavity were irregular but quite distinct. Macroscopically, it seemed to have no communication with the root canal, but it was apparently the point of entrance to a more extensive labyrinthine excavation which increased in size as it penetrated into the hard tissues. Serial sections of the tooth revealed a process of intradental resorption, starting apparently at the lesion on the vestibular aspect, although its real origin lay in the corresponding part of the marginal periodontium.

Study of the longitudinal sections disclosed the manner in which the lesion had progressed through the dental tissues. The resorption began at the circumscribed point on the vestibular aspect and proceeded toward the dentin. In the beginning, it did not enter the root canal but surrounded it, extending axially. The pulp reacted with the formation of a layer of secondary dentin in front of the resorption cavity. Although the propagation of the resorption tissue took place electively in the circumpulpal dentin, it eventually invaded this protective barrier of secondary dentin and broke through into the pulp chamber, resulting in both necrosis and apical periodontitis.

Differentiation between intracanalicular (intrapulpal) and extracanalicular (extrapulpal) resorption lesions (internal and external granulomas) has an important bearing on treatment. Teeth with intracanalicular or internal resorption lesions, that is, those starting in the pulp, may respond to conservative treatment, whereas those with extensive extracanalicular or external resorption lesions, that is, those starting from without, usually require extraction.

Universidad Nacional de Zulia, Maracaibo, Venezuela

Extractions

Extraction of impacted lower cuspids

A. Keil. *Kart.zahnärztl.Praxis* 8:400-401
May 1958

Patients should be informed that tooth extraction is a surgical procedure and sometimes, especially in instances of impaction or malposition, a complicated operation. The informed patient will accept the dentist as a surgeon, and will regard the fee as commensurate with the service performed.

Extraction of impacted or malposed lower cuspids can be made easier by routine reflection of the mucoperiosteum, thereby providing maximum access and preventing trauma to the soft tissues. The removal of such teeth can be accelerated by the judicious use of elevators.

In the removal of impacted or malposed lower cuspids, the upward motion must be emphasized along with a buccolingual motion. If no downward pressure is exerted, the root will not fracture. When sufficient space is present, the exposed cuspid should be grasped off-center. This permits a firmer grip without slipping, and rotation can be easily accomplished. Malposed lower cuspids often can be removed by twisting motions. Many dentists are afraid to risk a lingual tooth fracture; but actually many malposed lower cuspids can be removed best by accentuating the lingual pressure.

In extracting impacted or malposed teeth, excessive pressure should be avoided because the mandibular canal can be injured. Distal space should be created to permit tipping of the tooth. This is best obtained by using surgical burs or chisels.

Impacted lower cuspids are generally regarded as injurious to adjacent and overlying tooth structures and to general health. Extraction of such teeth is indicated in the earlier rather than in later years when surgical removal is difficult. Planning the surgical elimination of impacted lower cuspids is important. It is unfortunate that the dentist has to waste hours of chairtime to combat complications when, by timely planning, the operation could be completed in about 20 minutes.

In extraction of impacted lower cuspids, four conditions must be evaluated: (1) the relationship between the impacted tooth and the ascending ramus; (2) the position of the tooth in relation to the height of the lateral incisor and the first bicuspid; (3) the proximal relationship between the tooth and the adjacent teeth if they are overlying the impacted cuspid, and (4) the pathologic condition of the root of the tooth and the involvement of mandibular vessels.

The small jaw of modern man is the most frequent cause of maleruption, impaction and malposition.

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Analysis of one hundred cases of dry socket

T. Lehner. *D.Practitioner* 8:275-279
May 1958

During a period of eight months, 4,310 teeth were extracted from patients treated at the National Dental Hospital; 100 instances of dry socket were recorded and the total incidence therefore was 2.3 per cent. Of those with dry socket, none of the patients was under 18 years of age; 39 were from 18 to 25 years old; 47 were from 25 to 45 years old, and 14 were 45 years old or older.

The teeth whose removal precipitated the dry sockets were extracted in about 50 instances because of caries with acute or chronic pulpitis. Of the remaining patients, some had periodontal disease and others had pericoronitis involving third molars.

Of the 3,660 permanent teeth extracted, 3.1 per cent developed dry socket under local anesthesia and 2.2 per cent under general anesthesia.

In all patients with dry socket, pain and a fetid taste were constant features. Soft tissue swelling was noted in 18 patients, and trismus in three.

Pre-extraction and postextraction roentgeno-

grams were made in about 60 per cent of all patients. Of the 100 instances of dry socket, 20 showed a thickened lamina dura or sclerosis of the surrounding bone before extraction. Seven patients had a number of small sequestrums in the socket. These were visible, on the average, 21 days after extraction. Thirty-one patients showed no unusual features.

The primary etiologic factor in dry socket is believed to be a deficient local blood supply, and subsequent ischemia developed by the trauma of extraction.

Avascular necrosis may account for the dry socket, but further investigation is needed.

The dry socket may be irrigated at frequent intervals with warm saline solution and dressed with one of the proprietary preparations. If a severe and prolonged course is indicated, surgical measures are justified. The socket is syringed, and the walls of the socket are felt with a probe at different points; if any part does not bleed, it should be noted. A layer of bone is removed, preferably under general anesthesia, with a small chisel or bur until ample blood supply is encountered. After the debris has been washed out with warm saline solution, the socket is allowed to fill with blood.

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The efficacy of a placebo and several oral analgesics in the treatment of pain of alveolar osteitis

Robert Keesling and Arthur S. Keats. *Oral Surg., Oral Med. & Oral Path.* 11:736-741 July 1958

A study was undertaken in an attempt to find an effective means of controlling the pain of alveolar osteitis ("dry socket") with oral analgesics in ambulatory outpatients. One hundred outpatients of the oral surgery clinic of the Jefferson Davis Hospital, Houston, Texas, were treated on successive days with four drugs and a placebo, administered in random order. A double-blind evaluation was used. The drugs studied were: (1) acetylsalicylic acid, 0.6 Gm.; (2) anileridine dihydrochloride, 30 mg.; (3) dihydrocodeine bitartrate, 30 mg., and (4) an "analgesic" capsule containing methadone hydrochloride, 2 mg., d-desoxyephedrine, 1 mg., and pentobarbital sodium, 30 mg. The placebo capsule contained starch.

All evaluations of pain relief were made by two oral surgeons. Three categories of pain relief were used: most of the pain remained, most of the pain relieved, and complete pain relief. One score was given for each day of drug trial (five doses). All patients also were questioned about drug effects aside from pain relief. Not all patients completed the drug series.

Each of the four drugs studied produced higher pain relief scores than did the placebo. But 61 per cent of the 67 patients who received the placebo obtained adequate relief of pain. The drugs with greater analgesic effectiveness were associated with a higher incidence of unpleasant side actions.

In this study, which employed careful controls and experimental design, the differences between the drugs known to be analgesics and a placebo were demonstrated only with difficulty because of the high incidence of relief after administration of the placebo. An attempt to draw conclusions from studies similar to this one but without the safeguards of double-blind evaluation and placebo control would be most hazardous. Careful experimental design and placebo control must be used in any study which employs outpatients or patients seen in a private office. It is doubtful if any significance can be attached to the results of uncontrolled therapeutic trials carried out in an office practice.

Jefferson Davis Hospital, Houston, Texas

Transplantation of human teeth for the general practitioner

Louis C. Monteleone, Joseph W. Cush and John Giaroli. *J.Louisiana D.Soc.* 16:5-11 June 1958

A simple technic has been used successfully to replace 30 carious first molars with unerupted third molars. The procedure can be used by every dentist, but certain rules must be observed to assure success.

Only the patient interested in saving his dentition and intelligent enough to understand what is going to be done should be treated. The remaining teeth and supporting structures must be in good health. A roentgenogram of the third molar to be transplanted must show at least 3 mm. of root development; this indicates that the enamel is completely mineralized. The host site should be free of acute infection. The unerupted third molar must be about the same size as the tooth it is to replace. Usually the best patients are between 12 and 20 years old.

The patient is given prophylactic systemic antibiotic therapy—preferably tetracycline hydrochloride, since this drug rarely produces allergic manifestations—preoperatively and postoperatively. The operation may be performed in the office under local anesthesia. Block anesthesia is preferred to infiltration anesthesia. The surgical area is sponged with a bacteriostatic solution and isolated with sponges. A mucoperiosteal incision is made with a sharp blade from the distobuccal region of the developing third molar to the distobuccal region of the second molar. The gingiva is detached from the carious first molar to be extracted and brought as far forward as the first bicuspid. If the first molar already is missing, an incision similar to that in an alveoplasty is made. Hand chisels or surgical bone burs are used to remove sufficient alveolar bone so that the developing third molar follicle may be lifted easily from its crypt. Elevators should not be used. If Hertwig's sheath is injured, root formation will cease and the graft will fail. After exposure and removal of the developing third molar, a suture is placed through the buccal surface to insure proper placement of the follicle in the new position. The tooth is then transferred to a beaker containing an aqueous suspension of penicillin which prevents drying and contamination.

The carious first molar should be extracted without undue trauma. A necrotic alveolus or "dry socket" is the cause of 90 per cent of the failures that occur in free grafting. The basic problem is to obtain sufficient space for the third molar. If the graft is subjected to occlusal forces while in its revascularization phase, it will fail.

The new site is prepared with surgical burs and chisels. All interseptal bone is removed. The third molar is removed from the penicillin solution and placed as deeply as possible in a vertical position in the newly created socket. The incision is closed with no. 000 silk suture. One suture over the occlusal portion of the crown gives added support. A thinly mixed surgical cement is placed on a piece of tin foil taken from a used dental film and adapted to the graft and abutment teeth. The patient, before the cement hardens, is instructed to close in centric and all eccentric positions. Discomfort or pain is rare. After one week the sutures are removed and another pack is adapted. Within two to six weeks the tooth is firm and will function normally, with the exception that the eruption may not yet be complete.

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Public health dentistry

Dental health education in Italy, Switzerland, and Germany

D. H. Goose. *D.Practitioner* 8:286-291 May 1958

There is a bewildering number of agencies involved in providing dental care in Italy, including the Eastman Clinic, School Dental Service, I.N.A.M. (public assistance), the E.N.P.A.S. (for state employees), and the I.N.A.I.L. (National Institute for Accidents at Work). Dental health education does not thrive. Fruits and salads are eaten at every meal in Italy, and the cleansing effect of these foods on teeth are considerable.

Switzerland is divided into 22 cantons, each autonomous in education and health matters; also, four different languages are spoken. It is difficult to organize a nationwide dental health education program, although many leading dentists in Switzerland believe this is necessary. About 190,000 Swiss children are treated by 585 private dentists under a specified fee schedule; 120,000 children are treated in clinics by 81 school dentists; 10,000 children living in the more inaccessible areas are treated by ten school dentists, and 80,000 children are treated by private practitioners charging private fees. Thus, 80 per cent of the school population receive regular dental inspection and treatment. In most areas, talks are given by the dental officers to children and their parents, and suitable pamphlets are distributed. School teachers and health visitors are provided with booklets on dental care. A special form is used to notify parents if the oral hygiene of the child is being neglected, and to recommend means to improve oral hygiene. Correct diet is stressed. In Basel apples are available at a low price in the schools so that they may be eaten by the children after their meals. The Swiss have no program for fluoridating water supplies; they are concentrating more on putting fluoride into other vehicles, such as in salt, in milk, and in tablets. As it seems difficult to control the intake of fluoride in these vehicles, no doubt it will be difficult to evaluate their efficiency.

Western Germany is divided into ten self-governing states. No standard dental record card prevails. However, a Youth Dental Service was set up in 1949 to deal with children, and has representatives in all the states. The objectives of the service are examination and supervision, early dental treatment and preventive measures. Dental treatment for children in Western Germany may be arranged in three ways: (1) examination and treatment by the school dentist; (2) inspection by a school dentist and referral to a general practitioner for treatment, with re-inspection by the school dentist, and (3) examination by a school dental officer who treats about 10 per cent of the children, the rest being seen in general practice. The Youth Dental Service distributes oral hygiene educational material to children, teachers and health visitors. Teachers are required by law to teach oral hygiene at least twice a year.

Dental consciousness among the general public in these three countries is greater than in England. The ratio of dentists to population is higher than in England.

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Pathologic studies in man after prolonged ingestion of fluoride in drinking water. I. Necropsy findings in a community with a water level of 2.5 ppm

E. F. Geever, N. C. Leone, P. Geiser and J. Lieberman. *J.A.D.A.* 56:499-507 April 1958

Necropsies were performed or supervised by the senior author on 904 patients between 1947 and 1953 in Colorado Springs, Colo., a community in which there was a natural fluoride level of 2.5 ppm in the drinking water. During that period, the senior author had no special interest in fluorides, and no special attention was given to the bones, a known storehouse for fluorides. This study was complemented in Part II by another undertaken between 1955 and 1957 with detailed examination of bones.

Since the main goal of this study was to determine cumulative toxic effects of fluoride over long periods, if present, newborn infants and children under ten years old were not considered. The final analyses consisted of 728 necropsy protocols. There were 188 persons (25.8 per cent) who had lived in Colorado Springs for less than five years; 130 (17.9 per cent) from 5 to 20 years, and 334 (45.9 per cent) who had resided in Colorado Springs 20 years and more. In the fourth group in which the duration of residence in Colorado Springs was unknown, there were 76 persons or 10.4 per cent.

The results of re-examination of the protocols and classification of the data into the major cause of death, contributing causes and incidental pathologic conditions were tabulated.

Comparative statistical analyses of the pathologic findings revealed no significant differences which could be related to prolonged residence in this environment.

St. Francis and Glockner-Penrose Hospitals, Colorado Springs, Colo.

Pathological studies in man after prolonged ingestion of fluoride in drinking water

E. F. Geever, N. C. Leone, P. Geiser and J. E. Lieberman. *Pub.Health Rep.* 73:721-731 Aug. 1958

Public health programs to prevent dental caries by the artificial fluoridation of drinking water always have considered the possibility of cumulative toxic effects. The present studies were instituted to determine whether pathological changes could be correlated with prolonged ingestion of water bearing fluoride.

Microscopic examinations were made of 99 bones from 37 persons undergoing postmortem examination. These persons had resided ten years or more in communities where the drinking water contained from 1 to 4 ppm of naturally occuring or artificially added fluoride (Grand Rapids, Mich., 1 ppm; Colorado Springs, Colo., 2.5 ppm; Amarillo, Texas, 2.8 ppm, and Lubbock, Texas, 4.0 ppm). Ninety-four bone specimens from 33 persons who had lived in areas where the drinking water contained less than 0.5 ppm fluoride were used for comparison. In most instances three bones were selected for study: the body of a lumbar vertebra, a portion of iliac crest, and the sixth rib. In addition, the lumbar intervertebral body joints were examined for possible changes in articular cartilage.

The microscopic examinations showed no significant differences between the group exposed to fluoride and the control group that could be related to fluoride intake. Microscopic changes in the bones and joints incidental to aging and due to conditions not related to fluoride were observed in both series.

St. Francis and Glockner-Penrose Hospitals, Colorado Springs, Colo.

Fluoride deposition in human bones after prolonged ingestion of fluoride in drinking water

I. Zipkin, F. J. McClure, N. C. Leone and W. A. Lee. *Pub.Health Rep.* 73:732-740 Aug. 1958

In conjunction with the microscopic examination of human bones for possible effects of prolonged ingestion of fluoride in drinking water (carried out by Geever and others, 1958), essentially the same bones were analyzed for ash and fluoride. This study represents the first systematic survey of the fluoride concentration of bones of persons exposed to various concentrations of fluoride in drinking water. The 69 persons in the fluoride deposition study, 40 men and 29 women aged 26 through 90 years, provided 190 bones and 64 specimens of intervertebral cartilage. About 80 per cent of these bones and cartilage specimens also were examined histologically.

The bones, which showed no significant histological changes, contained up to 0.548 per cent fluoride on a dry, fat-free basis and 1.080 per cent fluoride on an ash basis. The mean ash content of the iliac crest and ribs varied from 57.4 to 61.2 per cent and that of the sternum and vertebra from 44.6 to 53.7 per cent.

At any given level of fluoride in the drinking water, the various bones contained, on a dry, fat-free basis, similar concentrations of fluoride. The fluoride concentration of the intervertebral carti-

lage was considerably less than that of the bones.

The concentration of fluoride in the bones increased in an essentially linear fashion with an increase of fluoride in the drinking water up to 4.0 ppm.

The fluoride data in the present study, coupled with the microscopic findings on essentially the same material (Geever and others, 1958), constitute substantial evidence that a concentration of fluoride as high as 0.548 per cent in the dry, fat-free bone and 1.080 per cent in the bone ash (for subjects in both studies) may be present without producing any apparent tissue damage.

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Nutrition in prevention of dental caries

J. P. Dustin. *Internat.D.J.* 8:186-188 June 1958

The observation of human groups living in the most primitive conditions—Eskimos, North American Indians, the Masai of Africa, African Kikuyus, Egyptian fellahs and Cuban sugar-cane workers—shows that the most abnormal diets are compatible with an excellent dental status, and that these diets seem to condition the resistance to caries. World War II showed in Norway and Germany that excessive dietary restriction brought within three years a significant reduction in incidence of tooth decay.

It is clear that inadequate or even grossly insufficient nutrition is positively correlated with resistance to dental caries. However, the "back to nature" proposals advocated by some hardly can be considered seriously, if only because carrying out such proposals would initiate a series of drawbacks more harmful than caries itself. There is no alternative to the present trends of nutritional evolution, even if the resulting effects do not prove as beneficial in the dental field as in its more general consequences. The industrial processing and purification of natural foodstuffs are more imperatively needed than meets the layman's eye.

Caries is certainly a consequence of civilized eating habits. Since there is no significant evidence that caries can be related positively to any nutritional deficiency, the possibilities of caries prevention by diet depend on the better knowledge of the biological implications of food processing, and in the use of such factors as fluoridation which provide a partial compensation for present shortcomings.

But palliative measures, however successful, cannot answer the basic question why an otherwise highly adequate diet happens to be so remarkably cariogenic.

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The epidemiology of dental caries

G. N. Davies. *Internat.D.J.* 8:169-170 June 1958

Clark defines epidemiology as "the science concerned with the study of factors that influence the occurrence and distribution of disease, defect, disability, or death in aggregations of individuals." The application of epidemiology to the study of dental caries is complicated by a lack of precision in diagnosis and by contrasts or similarities which often are slight or indefinite. Epidemiologic methods must be standardized. The dental caries-fluoride relationship is a classic example of what epidemiology can achieve when methods are standardized.

Since epidemiology involves an orderly scientific collection and analysis of data, all relevant factors must be observed, recorded and analyzed. Dental epidemiologists already have established several relevant factors which influence the prevalence of dental caries within specific population groups. These factors are: age, sex, fluoride in drinking water, superficial deposits on deciduous teeth, malocclusion, attrition, hypoplasia of deciduous teeth and variations in diet and nutrition.

The relevance of other variables, the influence of which has been suggested but not established, also must be assessed. Examples of such factors are: intelligence and personality, gingivitis, masticatory function, cigarette smoking, oral hygiene, socioeconomic status, breastfeeding, general health and length of residence in an urban area. Other variables which may influence the prevalence of dental caries in different population groups are: mean annual temperature and hours of sunshine, rainfall, relative humidity, altitude, latitude, soil type and the mineral and trace element content of drinking water.

A uniform method of observation includes the

establishment of standards: first, for the type of examination (for example, mirror and explorer examination with and without the aid of roentgenograms); second, the method of examination (for example, the use of explorer points of standard dimensions as recommended by Parfitt in 1954), and third, the criteria for the recognition of a carious lesion.

A uniform system of recording the observations also is an essential preliminary step in the study of dental caries. The usual method of dividing the mouth into quadrants and of numbering the permanent teeth 1 to 8 and the deciduous teeth A to E in each quadrant is cumbersome, time-consuming and leads to errors. A better system is to number all permanent teeth from 1 to 32 beginning at the upper right third molar, and to number all deciduous teeth from A to T in the same way. Each tooth would then have a specific number or letter.

The form on which observations are to be recorded should be large enough to allow all relevant factors to be noted, and should contain a chart on which the location and extent of each carious lesion can be recorded.

Future epidemiological studies should be designed so that the influence of predisposing factors on dental caries of specific surfaces of individual teeth can be assessed. Finally, epidemiological data must be tabulated and analyzed according to recognized statistical principles.

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Quantitative determination of lactic acid production in suspensions of plaque material

Göran Frostell and Rakel Rhodin Blomberg. *Svensk tandläk.Tskr.* 50:407-413 July 1957

Dental plaque material from 20 patients was investigated. Ten of the patients had a high caries frequency and ten a low caries frequency. The rate of lactic acid production varied between 0.03 x 10^{-6} and 2.32^{-6} M of lactic acid per milligram of dried material per hour. For the ten patients with a high caries frequency, the mean was 1.11 x 10^{-6}; for the second group, 0.63 x 10^{-6} M. Tests performed at intervals on the same patient showed that the capacity for lactic acid production varied greatly. Differences in caries activity could not be explained by an *in vitro* method.

An attempt was made to find an index of caries activity by combining the results of the determinations of the rate of lactic acid production, the rate of secretion and the buffering action of the saliva. However, it was not possible by this means to explain the differences in caries activity in selected instances, probably because other factors also influence the process.

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Salivary sodium, potassium, and chloride levels in subjects classified as to dental caries experience

Ira L. Shannon. *Air Univ.,School Aviat.Med.* 1-6 April 1958

A reliable index of dental caries activity based on the chemical analysis of the saliva long has been a goal of dental research. The present investigation was designed to determine the sodium, potassium and chloride levels of mixed saliva collected from men varying in age from 17 to 23 years. The subjects were classified into three oral status categories ("carious," "resistant" or "restored"). No exogenous salivary stimuli were used. The following conclusions were reached:

1. No significant differences in volume levels were noted among the three groups of subjects.
2. The mean potassium levels were not significantly different for the three categories.
3. The mean sodium level for the "resistant" group was significantly lower than the mean sodium values for the other two groups. No significant difference was found between the "carious" and "restored" categories.
4. The chloride mean level for the "resistant" group was significantly lower than the mean level for the "carious" group. A similar but even more significant difference was found between the chloride mean level of the "resistant" and "restored" subjects.
5. Although significant differences were found for both the salivary sodium and chloride levels

when "resistant" and "carious" subjects were compared, no significant differences were noted between the "carious" and "restored" groups.

6. The predictability of an individual's dental status based on salivary volume and sodium, potassium and chloride levels would be, at best, extremely low. Although significant differences were found when the mean levels for the three groups of subjects were compared, there was an extensive overlap in values for individuals throughout the three groups.

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Experimentally produced caries by exposure to solutions with a base of refined glucides

Juan Carlos Muracciole and Alberto Dominguez. *Rev.A.odont.Argentina* 45:281-286 Aug. 1957

In a previous article dealing with attempts to produce caries experimentally, the authors discussed the effect of acids on the surface of enamel. The present study is concerned with the second stage of the investigation, in which two factors were utilized; refined glucides and saliva, in the form of solutions of high osmotic concentration. These factors are combined in this form in dental plaques. According to Fosdick's calculations, the osmotic pressure in dental plaques may exceed 30 atmospheres—a high figure as compared with 7.6 atmospheres found in the blood.

The experiments were carried out in 20 teeth, cuspids and third molars, which had to be extracted because of failure to erupt. In all teeth the normal integrity of the surface of the enamel was checked both by examination with a loupe with 20-diameter magnification and by roentgenographic study. The teeth were then converted into osmometers by the Turrell method, in which the crown is entirely covered with wax except for a small window, through which the attacking mediums may exert their effect. The converted teeth, divided into four lots of five teeth each, were then exposed to five different solutions (attacking mediums) for periods of 43, 26, 20, and 15 days; the changes in the pH of each solution were measured at weekly intervals. Tabulation of the results showed that when an attacking medium composed of refined glucides and highly cariogenic saliva exerts its effect for more than 20 days, typical lesions resembling those of caries appeared on the surface of the enamel. When the period during which the teeth were exposed to the solution was less than 20 days, however, the only lesions produced were those of decalcification. Only decalcification lesions were produced by an attacking medium consisting of glucides and noncariogenic saliva even when lactic acid was added to the solution. Decalcification, however, was neither produced by a combination of lactic acid and saliva alone, because the buffers neutralized the acid, nor were any lesions produced by submersion of the teeth in glucose alone.

These findings seem to show that (1): decalcification is the first stage in caries, and (2) decalcification results from a combination of refined glucides and saliva. Finally, it was established that lactic acid, glucides or saliva alone cannot produce caries. The nature of the factors that make some but not all saliva actively cariogenic is now being investigated.

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Relationship of fluoride and dietary fats to serum cholesterol in rats

Wolfgang Buttner and Joseph C. Muhler. *Proc.Soc.Exper.Biol.& Med.* 98:620-622 July 1958

To determine whether the use of fluoride is associated with an increased serum cholesterol level, the serum cholesterol level was determined in five series of rats receiving either different fats in their diets or different fats plus fluoride which was administered in the drinking water or by stomach tube.

After the consumption of 2 mg. of fluoride daily throughout a ten-week period there was no significant change in the serum cholesterol level of rats, regardless of their dietary fat source or the presence of fluoride. A comparison of body weight gains of the various groups fails to suggest that any of the fats used resulted in increased fluoride toxicity.

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Therapeutics

Tissue reactions in white rats after intramuscular injection of DBED-penicillin [benzathine penicillin]

Gunnar Björlin and Gösta Gustafson. *Odont.Revy* 9:83-105 No. 2, 1958

The early forms of penicillin were rapidly soluble; these forms have been superseded by less soluble ones, of which benzathine penicillin is an example in common use. Clinical experience has shown that injections of benzathine penicillin are followed by pain and tenderness at the site of injection and that these may persist for several days.

To investigate local tissue reactions to injections of benzathine penicillin, experiments were performed on white rats weighing about 150 Gm. The doses were not related to body weight; 0.3 ml. of benzathine penicillin (Penditan) was slowly injected into the gluteus maximus muscle on one side; as a control, 0.3 ml. of physiological salt solution was injected at the corresponding site on the other side. A stop was fixed on the needle 6 mm. from the point to ensure that the solution always was injected at the same depth. The animals were sacrificed at intervals of from half an hour to one month after injection, and the muscles containing the deposits were dissected, fixed, stained and studied histologically.

The results showed that, soon after the injection, a dense round cell infiltration was found surrounding the benzathine penicillin. Collections of granulocytes were present in tissues removed two hours after injection. After one day, a massive infiltration of granulocytes and large numbers of eosinophil leukocytes were observed. At this stage, inflammatory cells were present even at relatively great distances from the site of the injection, and had invaded both fat and muscle fibers. After 16 hours, there was evidence of "walling off" of the deposit by cells. Granulation tissue began to form after about two days. The border of the deposit gradually became more sharply defined. Degenerative changes were observed in muscle tissue, fat tissue and blood vessels. The deposit of penicillin gradually became encapsulated and after seven days was surrounded by a capsule of fibrous tissue. After 30 days, penicillin still could be observed macroscopically in the tissues.

In the animals which had been injected with physiological salt solution, there was an insignificant increase in the cell elements in the few hours immediately after injection. Tissues removed 24 hours or more afterward showed no variation from the normal.

The results show that the benzathine penicillin used in the present investigation had a damaging effect on the soft tissues. Similar experiments were done on rabbits and guinea pigs, with the same results. It seems likely that the pain associated with injections of benzathine penicillin is caused by tissue damage of a similar type to that observed in animals.

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Treatment of aphthous ulceration of the mouth

S. C. Truelove and R. M. Morris-Owen. *Brit.M.J.* No. 5071:603-607 March 15, 1958

Aphthous ulceration of the mouth is one of the commonest minor maladies. In the British Isles probably more than a million persons are affected with the condition. In its common or minor form a single ulcer or a small crop of ulcers appears on the buccal mucous membrane several times a year. The ulcers occur most often on the inside of the cheeks opposite the molars, inside the lips, and occasionally on the tongue, although any part of the mouth or pharynx may be affected. The

ulcers are painful and interfere with speech and eating, but normally they run a short course and heal in about a week without scarring.

Some patients suffer from a major form of aphthous ulceration, a much more severe condition. The ulcers are multiple and the patient may be seldom free from them over a course of years. In this form, the disorder ceases to be merely a painful inconvenience and assumes the dimensions of an incapacitating illness. Aphthous ulceration also may be one feature of a disease in which the skin and the mucous membranes of several areas may be involved, or the ulceration of the mouth may be a symptom of some underlying disease, such as tropical sprue, idiopathic steatorrhea, and ulcerative colitis.

The etiology of aphthous ulceration is essentially unknown. Treatment is empirical and has remained unsatisfactory.

In view of the fact that cortisone and its analogues have been found useful in the treatment of inflammatory conditions when applied locally, it is natural to wonder whether these compounds have a use in the treatment of aphthous ulceration. Hydrocortisone ointment has been tried but found not very helpful. The mouth is not a suitable place for the use of an ointment.

The authors tried a method of treatment of aphthous ulceration of the mouth, using a water-soluble compound of hydrocortisone incorporated in tablets which dissolve slowly in the mouth. The saliva acts as the medium of transport to the mucosal surface. Glaxo Laboratories prepared a tablet especially for use in the mouth; it contained 2.5 mg. hydrocortisone in the form of its hemisuccinate sodium salt, a compound freely soluble in water. The tablet has a lactose base and is designed so that it will dissolve slowly.

Treatment has been given to 52 patients, of whom 23 had the common or minor form of the malady, 22 had the major form, and 7 had mucomembranous disease or aphthous ulceration complicating another disease.

With one exception, the patients with the minor form of the disease obtained rapid relief of pain. Healing of the ulcer was accelerated. Those with the major form of aphthous ulceration generally have obtained great benefit from the treatment. All showed initial improvement. With maintenance treatment some have been completely free of ulceration during several months of observations. Others have had minor ulceration but are greatly improved. One has shown a tendency to relapse during treatment.

The method of treatment is effective, simple and safe. A tablet is easily held in the mouth and will rest in the gingival sulcus, where aphthous ulcers most commonly occur. The slow dissolution of the tablet ensures that the ulcer is bathed for rather a long period in saliva charged with hydrocortisone. The maximum dose has been four tablets a day, which represents 10 mg. of hydrocortisone, a dose unlikely to have any harmful systemic effect, however long continued.

To be effective, the tablet must be kept in close relation to the ulcer.

It is a common view that aphthous ulcers are psychosomatic or allergic manifestations. The authors have been more impressed by the mental disturbance created by the major form of aphthous ulceration and by the improvement in mental well-being when treatment is effective. Ten cases are reported.

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Hemostatic action of thrombokinase: experimental and clinical observations

A. Aghina. *Gior.ital.chir.* 10:609-614 June 1958

An investigation of the applicability of thromboplastin (thrombokinase) as a hemostatic agent in operative dentistry and oral surgery was carried out at the Oral Surgical Clinic of the University of Naples, Italy.

A preparation of thromboplastin, from the cerebral tissue of cattle, has been produced in Italy under the proprietary name "Tachostyptol 733." In vitro studies with dogs showed that the preparation, if administered in large amounts, lengthens the coagulation time. If administered in small doses, however, it shortens the coagulation time.

Intravenous injections into the oral tissues of dogs accelerated clot formation within 30 minutes, lowered the recalcification time of plasma, and had variable effects in converting prothrombin into thrombin.

Tachostyptol 733 was also injected into the oral tissues of nine patients—in six patients prior to and

in three after surgical removal of malignant oral tumors. The thromboplastic substance diminished bleeding at operation, prevented postoperative hemorrhage in eight patients, and proved useful in controlling postoperative hemorrhage which occurred in one patient.

Tachostyptol 733, when applied topically, exerted an excellent hemostatic effect and proved to be of value in operative dentistry and oral surgery for speedy control of hemorrhage, especially in instances in which suturing was contraindicated.

It can be concluded that Tachostyptol 733 can be depended on for a good and continuous hemostatic action because the preparation is nontoxic and, if injected intravenously, does not cause serious embolism.

Tachostyptol 733 is available in 30 ml. vials, each containing 5,000 units of bovine thromboplastin.

Via E. de Marinis 19, Naples, Italy

Prednisone and prednisolone in dental practice

Günter Pfannenstiel. *Kartei zahnärztl.Praxis* 8:G-6 July 1958

The inner portion of the adrenal glands, the medulla, produces epinephrine. The outer portion, the cortex, produces cortisone, hydrocortisone and at least one other, as yet not isolated, hormone which probably is also a steroid and is associated with the mineral metabolism. About 25 other steroids are present in the adrenal glands, mainly in the cortex, but they have little or no physiologic activity and may serve as intermediate steps in the production of cortisone and hydrocortisone.

The physiologic activity of human and animal cortical hormones can be summarized under three aspects: (1) mineral metabolism; (2) organic metabolism, and (3) tissue reaction. The beneficial results produced by the physiologic steroids are manifested in the relief of about 20 different diseases. The adrenal cortex is not directly involved in the the etiology of these diseases, and the manner in which the adrenal hormones produce their therapeutic effect is not known. The activity of the adrenal cortex is controlled by the pituitary gland through the adrenocorticotropic hormone (ACTH).

The recently developed synthetic cortisone derivatives, prednisone and prednisolone, made it possible to use corticoid therapy in dental practice without the use of genuine adrenal hormones. The use of these hormones was abandoned because of the lack of reasonable evidence of usefulness and safety.

Prednisone and prednisolone are from three to five times as potent as cortisone or hydrocortisone, and their anti-inflammatory and antiallergic, antiarthritic and antirheumatic properties promote prompt and prolonged relief of inflammatory and allergic conditions in the oral cavity without causing edema or sodium retention. Favorable symptomatic response was observed in the preoperative treatment of malignant oral tumors. Dosage varies with the severity of the disease and with the individual patient. The initial dosage, orally administered, is from two to six tablets daily, in divided doses. Each tablet contains 5 mg. prednisone or prednisolone. After one week, or sooner if favorable response is observed, the daily dosage can be reduced. If the symptoms do not recur, the maintenance dose is established at the level of the lowest dose which keeps the patient comfortable and free of symptoms.

Prednisone and prednisolone are used routinely at the Friedrich K. Krupp Dental Clinic in Essen, Germany, in the treatment of allergic reactions, inflammations due to various causes, dermatoses and eczemas occurring in the maxillofacial region and of benign and malignant oral tumors prior to surgery. These drugs produced speedy relief in instances of postoperative and posttraumatic irritation phenomena in the regions of the eyes, ears, the nose and the mouth.

The dentist must always keep in mind that prednisone and prednisolone are extremely potent drugs with profound physiologic effects. All of the precautions and contraindications for use of cortisone or hydrocortisone must be followed.

Lazarettstrasse 7, Essen, Germany

History

Development and use of the rubber glove in surgery and gynecology

Curt Proskauer. *J.History Med.* 13:373-381 July 1958

Although the value of a thin, pliant glove for the surgeon's hands had been pointed out by several people, among them Richard F. Cooke, Thomas Watson and Ignaz Philipp Semmelweis, the use of rubber gloves in surgical operations resulted from a surgeon's compassion for the sensitive skin of his nurse's hands. William Stewart Halsted, first professor of surgery at Johns Hopkins Medical School in Baltimore, told the following story:

"In the winter of 1889 and 1890 . . . the nurse in charge of my operating room complained that the solutions of mercuric chloroid produced a dermatitis of her arms and hands. As she was an unusually efficient woman, I gave the matter my consideration and one day in New York requested the Goodyear Rubber Company to make as an experiment two pair[s] of thin rubber gloves with gauntlets. On trial these proved to be so satisfactory that additional gloves were ordered. In the autumn, on my return to town, the assistant who passed the instruments and threaded the needles was also provided with rubber gloves to wear at the operations. . . . This assistant was given the gloves to protect his hands from the solution of phenol (carbolic acid) in which the instruments were submerged rather than to eliminate him as a source of infection."

Halsted reported that the assistants in time became "so accustomed to working in gloves that they also wore them as operators and would remark that they seemed to be less expert with the bare hand than with the gloved hands."

Joseph Colt Bloodgood, Halsted's house surgeon, was the first to wear rubber gloves invariably when operating. A study by Bloodgood established that the incidence of suppuration of the wound after operation for inguinal hernia fell from 29 per cent to less than 1 per cent after the operators and all assistants began wearing rubber gloves.

James F. Mitchell, anesthetist in Dr. Halsted's operating room, introduced the method of anointing the hands with a sterilized boric ointment before the gloves were pulled on, so that the gloves would slip on more easily and would be less likely to tear.

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Early American dentistry

Editorial. *New England J.Med.* 259:403-404 Aug. 21, 1958

The published literature on dentistry in America is eagerly sought by collectors of Americana, since modern dentistry was almost exclusively developed in this country. The first books were mostly in the form of pamphlets, designed as advertising material for the individual dentist. The outstanding example is a 26-page pamphlet entitled *A Treatise on the Human Teeth, Concisely Explaining Their Structure, and Cause of Disease and Decay,* by Richard C. Skinner, published in New York in 1801. This pamphlet brings one of the highest prices of all books published in America of medical or dental interest.

Skinner sold a dentifrice and an antiscorbutic tincture from his house on Fair Street in New York City. He seems to have been an honest man who treated the poor gratis, particularly those who were referred to him by a physician or surgeon of the city. Skinner was the founder of the first dental clinic in New York and author of the first book on dentistry in America. Ap-

parently, life was not easy for him in his younger days, for on September 29, 1788, he had written Benjamin Franklin, asking for a loan of $20 "to save him perhaps from . . . the horrors of a prison." Skinner had been trained in London by the Italian dentist, Bartolomeo Ruspini. Skinner moved to New York about 1791 and opened his clinic at the Dispensary of New York soon thereafter.

The second dental book published in the United States was by B. T. Longbotham, a surgeon dentist of Baltimore, who also had been trained in London. It was entitled *A Treatise on Dentistry, Explaining the Diseases of the Teeth and Gums, with the Most Effectual Means of Prevention and Remedy; to which is Added, Dentition; with Rules to be Observed during that Interesting Period,* and was published in 1802. This book was addressed both to the public and to dentists. Longbotham was a man of high ethical standards who tried to protect the public from abuses common to dental practice. He practiced in Baltimore but ultimately settled in Charleston, S.C. For eight years he appears to have been a resident of the island of Jamaica, for his book is dedicated "to the public of Jamaica." The 68-page book is much superior to Skinner's pamphlet.

8 The Fenway, Boston 15, Mass.

A history of anaesthesia in South Africa

H. J. Schmidt. *South African M.J.* 32:244-251 March 1, 1958

A dentist, A. Raymond, was the first person in South Africa to employ ether as an anesthetic agent. The following notice appeared in the April 20, 1847, issue of *De Verzamelaar:*

"Saturday last, an experiment was made by the Aether Vapour by Mr. Raymond, Surgeon Dentist, having drawn from a Gentleman two teeth, and from another one tooth, without causing any pain—we may therefore congratulate Mr. R. with the good result of his experiment."

Raymond, a graduate of the University of Paris, had his dental office in Cape Town at 27 Burg Street. He is reported to have used ether with great success, administering it from an inhaler.

One of Raymond's patients described for the newspapers his experience under ether anesthesia:

"A general thrill pervades the body to its very extremities at first, and there occur a series of, as it were, electric discharges in the brain—no better simile is at hand. These feelings give way to a dreamy state, in which external objects partly enter and partly appear excluded: to this follows an utter forgetfulness of everything. The soul appears to have cast off his earthly clog, and to be wandering it knows not where: in a word, there is a complete loss of individuality, a feeling as if one were another person altogether. At this time the operation was performed—the first tooth being extracted without a trace of pain, though it appeared to disturb the lethargic state, so that a dull pain of a trifling nature accompanied the removal of the second. Shortly afterwards the writer awoke, discovering, to his complete amazement, two grim looking teeth on the table at his side. No ill effects followed."

In 1936 the South African Medical and Dental Council resolved "that the administration of anaesthetics was an act pertaining to the calling of a medical practitioner." Dental practitioners, however, had been administering anesthetic agents since the early days, and in April 1938 a notice was sent to them, permitting them to utilize nitrous oxide for anesthesia. In 1944 the Council removed all restrictions on dentists by resolving that "in the practice of dentistry, the administration of anaesthetics by dentists should be unlimited."

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Pedodontics

Infantile scurvy: report of case

E. Glanzmann. *Internat.Zschr.Vitaminforsch.* 27:265-268 June 1, 1957

Infantile scurvy (Barlow's disease) is an avitaminosis due to the deficiency of vitamin C, and sometimes of vitamin D, in the diet. In its acute form, it is characterized by general weakness, spongy gingiva and tendency to hemorrhage in the mucous membrane, the periodontium and in regions below the epidermis.

Thanks to preventive procedures such as enriching the diet with fresh fruit juices and vegetables, today infantile scurvy is rarely seen in dental or medical practice. Periodontists and pediatricians, however, are in danger of forgetting the existence of this disease. During the last few years, infantile scurvy again has been observed occasionally. In the majority of instances, treatment with comparatively high doses of ascorbic acid (vitamin C) was successful.

In the case reported, the patient, a ten month old girl, had consumed a mixed diet which, however, did not include adequate amounts of fruits and vegetables. Titration of the urine revealed a deficiency of vitamin C. There were neither petechia nor severe hemorrhage present. Roentgenographic examinations showed the typical symptoms of infantile scurvy, especially visible in the oral cavity. Avitaminosis C was combined with avitaminosis D.

Vitamin C, in the form of "Redoxon," was administered orally, beginning with 50 mg. twice daily. The dose gradually was increased to 250 mg. twice daily. This treatment, combined with a diet rich in vitamins B, C and D, was sufficient to obtain an almost immediate improvement and, after two months, cure.

Injections of Redoxon are contraindicated because they may cause severe pain and unfavorable reactions.

Rickets which accompanied the infantile scurvy in the case reported was treated successfully by administering orally 20,000 I.U. ergosterol.

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Disorders associated with weaning and teething

David Morris. *M.Press* 239:581-583 June 18, 1958

Throughout infancy and early childhood, many minor disturbances cause concern if left unattended. No obvious explanation can be found for many of these disturbances, and for want of a better label they are ascribed to teething.

As teething occupies a considerable portion of the first few years of life, it is understandable why so many upsets are attributed to it. Some babies seem to suffer great discomfort when teething; with each tooth the child becomes irritable and difficult to manage. Continuous attempts to rub the red, painful-looking gums with any suitable object to hand are common accompaniments to teething. Salivation may herald the onset of an erupting tooth and persist for some days. A bright "hectic" spot may appear on the cheek of the affected side. Chloral hydrate can be given to relieve discomfort and irritability. Teething powders are of no value. Lancing of the gingivae is an unwise and useless procedure.

Fever, diarrhea, vomiting, bronchitis, convulsions and behavior disorders have all, at different times, been blamed on teething, but with no evidence to support the view that any of these can be caused by teething. In 1839 the Registrar-General's report showed that 5,016 deaths in England and Wales were attributed to teething. It may be that no cause can be found to account for a child's fever or diarrhea, but to call it teething is both foolhardy and dangerous; the diagnosis of teething has turned into a pneumonia, septicemia or meningitis.

Both weaning and teething are undoubtedly common causes of temporary upsets in young children. With adequate handling, they give rise to no further difficulties.

British Hospital for Mothers & Babies, London, England

A radiographic evaluation of the temporomandibular joint in children possessing excellent occlusion of the teeth

James W. Anderson. *Northwest.Univ.D.Res.Bul.* 58:8-12 Fall, 1957

The temporomandibular joints of 35 children possessing good function and excellent occlusion of the teeth were studied. The form and function of the condyle, and the size and shape of the articular fossa and eminence, were investigated through the use of lateral cephalometric and temporomandibular joint roentgenograms. The data were analyzed statistically and the results compared with those obtained by Donovan in 100 normal adults.

Clinical examination revealed that a midline deviation was present in many children possessing excellent occlusion.

A comparison of the findings in children with those in adults leads to the following conclusions:

The freeway space is similar in the child and adult. The condyle of the child is at about the same vertical relation in the cranium as the adult condyle at rest, occlusal, incisal, and retruded positions. The condyle of the child and adult are at about the same depth in the cranium at the occlusal, incisive and retruded positions. At rest position the child's condyle occupies a cranial relation anterior to that of the adult condyle.

The range of condylar movement from rest position to occlusal position is greater in the child. The range of condylar movement from rest position to the incisive position and from the occlusal position to the retruded position is less in the child.

The child exhibits a proportionally smaller articular fossa and eminence with the eminence being considerably less in height.

At rest position the condyle of the child is in an antero-inferior relation in the articular fossa, compared to the adult condyle-fossa relation.

The child tends to have a path of closure more vertical or more upward and backward than that of the adult.

During growth, porion bears a rather constant relation to the mandibular condyle. The mandibular condyle moves in a postero-inferior direction as the face and cranium develop.

Citizens Building, Aberdeen, S.D.

Electromyographic studies of certain masticatory muscles in physiologic condition

L. Vyklický and J. Káclová.
Československov.stomat. 57:39-45 March 1957

In the neurologic department of the University of Plzen, Czechoslovakia, the potential activities of certain masticatory muscles, especially the action currents in the masseter, internal and external pterygoid, and temporal muscles have been studied electromyographically.

In dental and medical literature, only a comparatively small number of reports on electromyography has appeared, and very few on electromyographic studies of the neuromuscular physiology of the masticatory mechanism.

Electromyography provides the researcher with a useful tool with which it is possible to observe the wide variety of neuromuscular activity in normal and pathologic conditions.

The studies were made with the aid of an electroencephalograph to which were attached an automatic crystographic inkwriting device, a synchronous controlled speed counter, a motor-driven paper feeder, a cathode ray oscilloscope and a sound amplifier. Thereby, the potential activity of single muscles, of muscle groups acting together, and of certain motor units were measured and recorded.

The activity of the masseter muscle was studied after monopolar needle electrodes were inserted parallel to the course of the muscle fibers, and surface electrodes were placed equidistant between the origin of the muscle and its boundary with the teeth in occlusion.

The activity of the internal pterygoid muscle was examined after monopolar needle electrodes

were inserted 3 cm. from the tip of the mandibular angle.

The activity of the external pterygoid muscle was recorded after coaxial needle electrodes were inserted through the mucous membrane in the region of the maxillary tuberosity.

The activity of the temporal muscle was determined after five surface electrodes had been placed at the anterior and posterior borders of the muscle to permit the recording of the slightest changes with the electroencephalograph.

The electromyographic patterns of these four masticatory muscles were studied in 100 healthy persons.

In the near future, the electromyographic patterns of these muscles will be studied in 100 patients with pathologic conditions such as malocclusion, edentulousness, disturbances of the temporomandibular joint, and cleft lip or cleft palate.

It was established that the mean time of total contraction in the masseter muscle is 4.6 seconds; in the internal pterygoid muscle, 4.3 seconds; in the external pterygoid muscle, 4.7 seconds, and in the temporal muscle, 5.3 seconds during lateral movements of the jaw.

In none of the electromyograms of these muscles was it possible to detect the so-called spontaneous activity at rest position.

The self-explanatory electromyograms reveal that the masticatory muscles contain thick motor units of medium size which are capable of rapid and nearly isometric electric responses during contraction.

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Changes in the trabecular pattern of the mandible following the loss of teeth

John O. Neufeld. *J.Pros.Den.* 8:685-697
July 1958

The human mandible is subject to radical changes when teeth are lost. These changes are seen in its gross form and in its internal structure, and they affect the efficiency of prosthetic restorations. A study was undertaken to determine the nature of the changes of the trabecular pattern within the mandible and to attempt to find a means for studying the causes of the individual variations in the changes that are known to occur. The material consisted of 150 human mandibles obtained from the anatomy department of Ohio State University; gross observations of 65 other mandibles were made; four mandibles from full-term stillborn babies and one mandible from a child about seven years old were also studied. Three main technics of studying the structures of the trabecular pattern of the dried mandibles were used: (1) ground sections, (2) decalcified specimens cut into serial sections, and (3) roentgenograms.

The following conclusions were reached:

1. Roentgenograms are as effective as the study of ground and decalcified sections in revealing the architecture of bone.

2. Roentgenograms provide a means of studying the mandibular development and changes in structure that occur over long periods of time and perhaps during the life cycle of an individual.

3. The greatest change in the trabecular pattern of the mandible throughout the life of an individual is in the alveolar process.

4. The trabecular pattern of the body of the mandible, after the loss of the teeth and the remains of the alveolar process, is reorganized in a random manner.

5. In some of the specimens studied, the trabecular pattern was arranged in such a way that it indicated some adaptation of the structure of the bone to the presence of an appliance in the region near the superior surface of the alveolar process.

6. There is no appreciable change in the trabeculae in the angle of the mandible between the dentulous and edentulous condition.

7. There is no appreciable difference in the trabecular patterns of the condyle and neck of the condyloid process in the dentulous and edentulous mandibles.

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Biochemistry

Observations of the acid mucopolysaccharides of human gingiva

Stig D. Schultz-Haudt. *Odont.Tskr.* 66:1-98 Feb. 1958

A study was made to establish the types of acid mucopolysaccharides present in human gingiva, and the action of bacteria isolated from human gingival crevices on these mucopolysaccharides.

Surgically removed human gingivae were collected in several dental clinics over a period of about two years. Polysaccharide materials were extracted from the gingivae by the procedure which Schiller and others (1954) used in isolating mucopolysaccharides from animal skin. Paper chromatography and colorimetric determinations showed the crude polysaccharide mixture to contain glucosamine, galactosamine and hexuronic acids, indicating the presence of hyaluronic acid and chondroitin sulfuric acid. The colorimetric determinations showed human gingiva to be considerably richer in acid mucopolysaccharides than human skin.

By means of paper electrophoresis, the presence of two acid mucopolysaccharides with different electrophoretic mobilities was established. The slowest moving fraction contained glucosamine and glucuronic acid, whereas the fastest moving one contained galactosamine and glucuronic acid. Thus, the presence in human gingiva of hyaluronic acid and chondroitin sulfuric acid was confirmed.

Electrophoresis of crude polysaccharide mixtures from gingiva also was carried out in a slab of Celite Filter-Aid. The results confirmed those obtained in the paper electrophoresis experiments, and, in addition, made it possible to isolate milligram amounts of apparently pure hyaluronate and chondroitin sulfate from human gingiva.

The isolated acid mucopolysaccharides were exposed to the action of bacteria isolated from human gingival crevices. These were either mixed cultures, or pure cultures of *Streptococcus mitis* (producing hyaluronidase) or of a diphtheroid organism (producing chondroitinase and hyaluronidase). The results demonstrated that the substrates were broken down readily by the activities of mixed bacterial cultures. Hyaluronate and part of the chondroitin sulfate were hydrolyzed by the diphtheroid organism, whereas hyaluronate was digested by strains of *Str. mitis.* Furthermore, the enzymic experiments suggested the presence of chondroitin sulfuric acid B in human gingiva, in addition to the A and C varieties. It also appeared that bacteria from the gingival crevice are capable of producing an enzyme acting on chondroitin sulfate B. Hitherto, only chondroitinases catalyzing the hydrolysis of chondroitin sulfate A and C have been described in the literature.

These studies deal with only one small facet of an extremely complex situation relating to the development of periodontitis. Further studies of the gingival tissues and their parasites ought to be rewarding, not only in relation to periodontosis, but with regard to the concept of the host-parasite relationship in general.

The bibliography lists 227 references.

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Lipid distribution in the developing teeth of the rat

N. B. B. Symons. *Brit.D.J.* 105:27-30 July 1, 1958

The distribution of lipid was studied in the developing teeth of rats from three to five days old. Some of the material was fixed by the method of Baker (1944) and frozen sections were cut. These were stained with Sudan Black B in 70 per cent alcohol for the demonstration of lipid generally. Other material was treated according to the method devised by Baker (1946) for the demonstration of phospholipids.

The heaviest concentration of lipid and of phospholipid in the developing tooth was found in the narrow basal zone of the tall ameloblasts, which are associated with formation of the enamel matrix. In the shortened ameloblasts asso-

ciated with maturation, this heavy concentration of lipid and phospholipid was absent.

The observation of sudanophilic staining of the odontoblast fibers agrees with those of Wislocki and others (1948) and of Wislocki and Sognnaes (1950).

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Fluoride content of urinary and biliary tract calculi

I. Zipkin, W. A. Lee and N. C. Leone. *Proc.Soc.Exper.Biol.& Med.* 97:650-653 March 1958

With the exception of the recent duplicate reports by Herman (1956) and Spira (1956), no data are available on the fluoride content of urinary tract calculi. Data on the fluoride content of biliary calculi appear to be limited to the report of Spira (1957).

Thirty-three samples of urinary calculi and nine samples of biliary tract calculi from persons with known histories of exposure to water-borne fluoride were analyzed for fat, ash, calcium, phosphate and fluoride. The fluoride content of the calculi also was compared with that of bone obtained from persons residing in low fluoride areas (0.0 to 0.6 ppm in the drinking water) and high fluoride areas (2.6 ppm in the drinking water).

The concentration of fluoride in urinary tract calculi was significantly higher than that in the bones.

The mean concentration of 0.25 per cent fluoride in urinary tract calculi of persons from low fluoride areas was not significantly different from that (0.37 per cent) of calculi of persons whose drinking water contained 2.6 ppm fluoride.

No relation was apparent between the calcium and fluoride concentrations of urinary tract calculi.

Fluoride was present in biliary tract calculi in very low concentration (from 0 to 0.006 per cent).

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A quantitative x-ray microscopical study of calcium in the cementum of teeth

Hans Röckert. *Acta odont.scandinav.* (Suppl. 25) 16:7-68, 1958 [in English]

The mechanism by which the teeth are attached and the nature of the process of shedding teeth have attracted much attention among dentists, and the cementum occupies a central position in this problem. As knowledge of the chemical composition in relation to structure of the cementum at different places in a tooth and under different conditions might give information as to functional properties, the greatest inorganic component, calcium, was investigated.

Quantitative roentgen-ray microscopy was employed to determine the calcium content in the cementum of teeth from 18 rhesus monkeys of various ages.

For the entire material the obtained means of the calcium content, expressed in percentage of dry weight of the entire cementum, was 23 per cent.

A comparison between deciduous and permanent teeth does not show any noticeable difference in calcium content. No systematic difference between different parts of the cementum can be detected in this material with the method used. From the calcium analyses performed, the variation in the same age group, that is, the biological variation, in many instances is bigger than the variation between different age groups. The mean of the calcium content for each kind of tooth, disregarding age, shows only a small variation. In other words, for the group of animals investigated there was no correlation between the position of the tooth in the mouth and the calcium content of the cementum.

In 35 mature deciduous teeth, with the roots progressively resorbed, the amount of calcium in the cementum did not deviate from that observed in the permanent teeth. There is no systematic difference between the regions in the cementum of mature deciduous teeth. This indicates that the demineralization that occurs during resorption seems to be local and not to be associated with a general decalcifying process.

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General

Further investigations into the nature of hygroscopic expansion of dental casting investments

K. Asgar, W. N. Lawrence and F. A. Peyton. *J.Pros.Den.* 8:673-684 July 1958

Two phases of hygroscopic expansion were studied. A method was devised for measuring the internal or effective expansion of the cavity in the investment. The effect of varying the silica content in the investment was determined. The following conclusions were reached:

1. The cavity starts to expand at the time that the loss of gloss is observed. When Ransom and Randolph Aqua-Pak investment is used, with 1.0 cc. water added, the internal expansion is about 1.2 per cent, whereas the external expansion is 2.0 per cent linearly.

2. Expansion takes place in a hygroscopic investment in two separate and distinct steps which may overlap if sufficient water is present. The first expansion results from the absorption of water, starting just prior to the loss of gloss and ceasing when the surface water is absorbed. The second expansion is much slower and is more or less independent of whether water was added to the surface. It seems probable that the second expansion is caused by the growth of crystals in the investment and may, therefore, be referred to as a part of the normal setting expansion of the investment. The first expansion appears to be the true hygroscopic expansion. Whenever the investment is saturated, the two expansions will overlap.

3. Pure silica can be made to show an expansion similar to the expansion observed in a hygroscopic investment, although perhaps the mechanism of each is different.

4. Results indicate that hygroscopic expansion is not caused by a continuation of the normal crystal growth, nor is it caused by water being drawn into voids or interstices by capillary action, although a portion of expansion may be due to crystal growth.

5. Any theory of hygroscopic expansion will have to take into account the fact that the maximum expansion takes place in an investment containing only 3 per cent to 6 per cent of Hydrocal.

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The growth of the human skull

James H. Scott. *J.D.A.South Africa* 13:133-142 April 1958

A correlated account of skull growth, with special reference to growth of the face, based on some recent investigations, is presented.

There are three methods of bone growth in the skull: (1) bone growth by the conversion of cartilage into bone; (2) growth by surface deposition of new bone, and (3) suture growth.

During the period from fetal life to about the third year after birth, growth at the various suture systems is most active. The growing brain, the growing eyeballs, the growing tongue and the cartilage of the skull base and nasal capsule are separating the cranial and facial bones which maintain contact with one another only by active growth at the sutures.

During the intermediate period from about the third year to about the seventh year, growth continues in certain isolated sutures but surface deposition plays a greater part in craniofacial development. Growth is active in the alveolar processes in preparation for the eruption of the permanent dentition, and this growth is the result of surface deposition of new bone beneath the mucoperiosteum of the gingiva. Apart from the cartilaginous growth center in the condyles, growth of the mandible is entirely by surface deposition, especially in the alveolar region and at the posterior border of the ramus. Growth of the cranial vault is partly the result of suture growth and partly the result of surface deposition and resorption.

By the third and final period of growth (from about the seventh year to adult life), the following portions of the skull have reached, or almost reached, adult dimensions: the cranial and orbital

cavities; the distance from the sella turcica to the foramen caecum; the distance between the inner margins of the orbital cavity (the width of the upper part of the nasal cavity), and the petrous region of the temporal bones.

Whereas John Hunter and others, in discussing growth of the maxilla, asserted that space is provided for the maxillary permanent molars by growth at the back of the maxilla as a result of continuing growth at the circummaxillary suture system, others (Brash, 1926, in pigs; Baume, 1953, in Macaca rhesus monkeys; Krogman, 1931, in anthropoid apes, and Friel, 1945, in man) have stated or produced evidence that the entire dentition migrates through the jaw bones. If the teeth migrate forwards, or forwards and outwards, space must be provided for them by surface deposition at the front and sides of the alveolar processes. Forward migration of the teeth will provide space at the back of the dentition for the erupting permanent molars without any necessity for growth at the retromaxillary sutures or resorption at the anterior border of the mandibular ramus. Resorption at the front of the ramus, however, probably occurs to some extent in relation to the backward migration of the temporal muscle attachment.

There is still need for further research in skull growth, a subject of vital importance in orthodontics and in many branches of oral surgery.

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New modification of the saliva collecting capsule

V. L. Tsaturov. *Bul.Exper.Biol.& Med.* 43:1:124-126 Jan. 1957

A capsule to register and collect the salivation during investigation of the secretory activity of the human glands was suggested by Leshli and improved by others. Even the latest model, however, had a substantial defect: the necessity of using a suction apparatus to attach the capsule over the orifice of the salivary duct. The suction mechanism requires the use of an additional suction tube which complicates the saliva-collecting system and may cause excessive irritation.

An improved saliva capsule avoids the installation of a suction mechanism. The usual capsule consists of two cups. The inner cup communicates with the duct orifice and serves to collect and bring out saliva. The outer cup, in which a vacuum is created with a suction bulb or vacuum pump, serves to attach and hold the capsule over the orifice of the salivary duct. In the improved capsule, the bottom of the outer cup is replaced by a rubber membrane with the help of which the capsule is attached over the salivary duct. The space between the two cups of the capsule is filled with water. The index finger is pressed on the rubber membrane, the water is pressed out of the space between the cups, the open side of the capsule is placed over the duct orifice and the finger is released. As the rubber membrane tends to recover its original position, a vacuum is created in the inner cup and the capsule becomes attached to the mucosa surrounding the duct orifice.

The rubber membrane can be replaced by one made of polyethylene or some other resilient material.

The new capsule is made of organic glass. It consists of a cylinder divided in half by a barrier, a rubber membrane, a constricting ring for fastening the membrane, a vinyl chloride tube for drawing out the saliva, and another tube through which the stimulating agents are supplied. In tests, the capsule has not become detached from the mucosa during a period of two to three hours. If the shape of the capsule is modified, it can be used to remove saliva from the duct of the sublingual gland.

Laboratory of Physiology and Pathology of Higher Nervous Activity, Academy of Medical Sciences, Moscow, U.S.S.R.

Personal safety and comfort as a form of insurance to the dentist

Paul C. White. *J.Philippine D.A.* 11:30-31 April 1958

Many things can be done by the dentist and his assistants to protect themselves from accidents and disease.

Eyes should be protected. Without some form of eyeglasses or spectacles, a piece of decayed tooth, a bit of pumice or a broken point of an instrument may be flipped into the eye of the

dentist. The dentist should choose optically ground lenses, with frames to suit the individual's needs.

In the dental office lighting should be of such a quality, both inside the patient's mouth and on the office equipment, that the eyes of the operator need not adjust sharply when the gaze moves, for instance, from mouth to bracket table and back to mouth. Lighting of the areas outside the patient's mouth should be diffuse but with an intensity that compares favorably with that of the oral light.

The paint used for office walls and ceiling should have a flat, soft finish, and not a shiny, glossy finish. If natural light is used in the northern hemisphere, the north light usually is considered best, with south second, east third and west last. Venetian blinds are helpful in adjusting and controlling light from windows.

Protective masks over the mouth and nose may be indicated if the dentist is using high-speed equipment. Casting machines of the centrifugal type can be enclosed in a metal guard or built into a bench well. Acids and other caustics used in dentistry should be kept in labeled containers, used with caution, and kept off the bracket table at all times. Caution in the use of x-ray equipment is necessary. Exposure to the direct beam of the x-ray machine and to secondary radiation should be avoided or minimized.

The dentist should have a complete physical examination annually. In oral surgery, the dentist should wear rubber gloves. He should avoid using "do it yourself" power tools unless he has been instructed in their use.

Comfort is important. Dental operating stools, sponge rubber mats, comfortable clothing, air conditioning and many other things are aids that should be employed if at all possible.

129 I Street, Chula Vista, Calif.

Basic principles of planning dental treatment

Charles M. Belting. *Mil.Med.* 122:395-398 June 1958

Dental treatment planning is the organization of a course of action designed to alleviate or eliminate one or more disease processes in the mouth and to restore and maintain the masticatory function as related to the total patient. Although treatment planning differs from diagnosis, the two disciplines are inseparable. A plan of treatment without a diagnosis is futile, and a diagnosis without a plan of treatment is little more than an academic exercise.

Certain basic principles and objectives of treatment planning apply to all diagnoses, however. Questions and observations in the diagnostic procedure fall into four categories: (1) vital statistics, (2) the chief complaint, (3) the medical and dental history, and (4) examination of the patient.

The vital statistics which most frequently influence the plan of treatment are the age, sex and occupation of the patient. Many dental operations planned for younger individuals are contraindicated in the aged patient.

The chief complaint helps guide the choice of treatment because often it leads to a diagnosis that otherwise might be overlooked.

A probing medical and dental history provides many valuable clues to a successful plan of treatment.

The examination of the patient influences the choice of treatment in direct proportion to the completeness of the procedure.

After collection and evaluation of the aforementioned data, the treatment plan should be directed toward accomplishment of three major objectives: (1) removal of the cause of disease, (2) restoration of function and (3) a durable response to treatment.

Removal of the cause of disease is limited to those oral conditions for which specific etiologic factors are known.

The restoration of oral function involves a consideration of articulation, expression and mastication. Helpful principles include the following:

1. A fixed restoration is preferable to a removable one in instances where the number and distribution of the remaining teeth will permit its use.

2. Replacement of all 28 teeth is not necessarily required to restore adequate masticatory function.

3. The efficiency of the remaining natural dentition should be weighed against the efficiency of complete dentures in coming to a decision of

whether to extract or retain the remaining teeth.

After a treatment plan has been developed, the final detail in the planning procedure is to arrange the various elements of treatment in their proper sequence. The usual sequence of treatment is as follows: (1) provision for medical evaluation and therapy of systemic conditions related to the oral problem in question; (2) treatment of acute oral conditions; (3) coronal debridement; (4) oral surgery; (5) periodontal treatment; (6) endodontic treatment; (7) restorative dentistry, and (8) prosthetic dentistry.

Veterans Administration West Side Hospital, Chicago 12, Ill.

The effective utilization of auxiliary dental personnel

George E. Waterman. *Mil.Med.* 122:405-407 June 1958

The effective utilization of auxiliary personnel in the various federal dental programs has stimulated increased interest in the subject among private practitioners. The dental profession is obligated to exploit all ethical means of increasing its capacity to provide quality dental services. One of the most rational and noncontroversial means of increasing this capacity is through more widespread use of auxiliary personnel and more complete utilization of their training and abilities.

The Navy maintains a ratio of 1.5 dental assistants per dentist; the Army, 1.5; the Air Force, 1.54; the Veterans Administration, 1.2, and the Public Health Service, from 0.54 to 1.5. The Veterans Administration and Public Health Service have been handicapped in retaining dental assistants because of the unrealistic Civil Service salary scale.

Factors which contribute to the failure of the dental profession to use auxiliary personnel more readily and effectively are the limited appreciation by many dentists of the value of using trained auxiliary personnel and the frequent turnover of auxiliary personnel in the dental office.

Few dentists employing assistants utilize them to their full potential. Ideally, each type of dental operation should be analyzed to find out which segments of the work should be delegated to assistant personnel.

Factors which facilitate the effective use of dental assistants include the following:

1. The dentist must have a broad working knowledge of how to use assistants.
2. The assistant must know what her duties are and how they should be performed.
3. The dentist and his assistants must strive for teamwork.
4. The layout of the dental office and equipment must be conducive to this teamwork.
5. The dentist must have a constant supply of patients.

Dental hygienists have not been utilized extensively in the federal dental services because the Civil Service pay scale cannot compete with the scale available to the dental hygienist in private practice. The federal dental services should seek to attract qualified hygienists and utilize their services.

The federal services have available all the conditions essential to maximum utilization of auxiliary personnel, and should exploit this method to the fullest.

Division of Indian Health, U. S. Public Health Service, Washington, D.C.

Hypnotism in general practice

A. A. Mason. *Practitioner* 180:597-603 May 1958

Hypnotism can be used in medical and dental practice, as it is easy to learn and requires no special ability or power. About 85 per cent of patients can be hypnotized. Hypnosis is an almost ideal anesthetic, although the deep trance necessary for profound anesthesia can be produced only in about 20 per cent of all patients.

About 50 per cent of patients can obtain, through hypnosis, analgesia sufficiently deep to permit painless cavity preparations, root canal treatments, reduction of fractures and dislocations.

Hypnotism, therefore, is especially valuable as an analgesic in dental practice, giving pain relief in a high percentage of patients without depressing the respiratory center.

Direct hypnotic suggestion aimed at the removal of symptoms is often useful in psychosomatic disorders such as dermatoses and allergies.

Habits and such mild compulsions as nail-

biting, thumbsucking, smoking, overeating and hiccups usually respond favorably to hypnotic suggestion. Hypnosis can be of more use to the general practitioner than to anyone else except the anesthetist.

There are some reasons why, if hypnosis is so safe and effective, it has not been widely used by the medical and dental profession. Patients who will agree to this type of treatment are the exception and not the rule. Even more important than the right type of patient susceptible to hypnosis is the right type of medical or dental hypnotist. Few practitioners are able to stare confidently and continuously into their patient's eyes using the technics of the professional hypnotist. Physicians and dentists who are practicing hypnotism are apt to become labeled, as many patients are fearful of the hypnotic procedure and the man who uses it. Any persistent abnormal dread or fear (phobia or anxiety) such as fear of dentists or dental treatment is an indication for hypnosis. It is, however, rarely used in general practice because there are usually easier alternative methods of treatment.

5 Bentinck Street, London, W. 1, England

Essentiality of experimental controls in research

Austin H. Kutscher, Neal W. Chilton, L. Franklin Bumgardner, Charles F. Bodecker, Wesley J. Dunn and Martin Rothman.
J.Oral Surg. 16:330-333 July 1958

A questionnaire eliciting opinions on the desirability of formulating and adopting a resolution or principle directed at emphasizing the essentiality of experimental controls in research was mailed by the scientific manuscripts committee of the American Association of Dental Editors to a representative group of consultants.

Pertinent comments from consultants included the following:

1. Statistical manipulation cannot compensate for an inadequate or noncomparable control.
2. A deficiency in control cannot be remedied by the inclusion of larger numbers of subjects.
3. Uncontrolled observations often are valuable, but with suitable controls they are usually of more scientific value.
4. Various control procedures usually are known to investigators but are not employed because of the additional time and effort required.
5. If some form of control is not used, the work hardly can be classified as research.
6. All original scientific research which can be controlled suitably should be controlled.
7. Opinions differ widely as to what is a control and as to what is a suitable or adequate control.
8. Referees in various fields should formulate statements as to appropriate controls.
9. Undue claims must not be condoned in the absence of controls.

Work for which controls may not be indicated include case reports and research involving unusual circumstances. A liberal, flexible interpretation should prevail. The importance of controls lies in the character and interpretation of conclusions drawn from the data.

The board of directors and members of the American Association of Dental Editors, together with the scientific manuscripts committee, have adopted the following resolution:

"In research investigations, the design of the study should include adequate experimental controls. Acceptance for publication of a report of an investigation performed without controls when controls were possible should, if justified, be considered an exception to this principle rather than a sound general practice. The ultimate responsibility (in terms of publication) for allowing such an exception should rest with the editor."

630 West 168th Street, New York, N.Y.

Work simplification: an application to dentistry

Edward S. Green and William A. Lynam.
J.A.D.A. 57:242-252 Aug. 1958

A study was conducted to determine the extent to which the technics of work simplification could be applied to the general practice of dentistry. Work simplification is an organized effort to find easier ways of doing work. Industry has utilized work simplification studies to achieve remarkable savings in time, material and energy. The development of a better method utilizes a five step pattern: (1) selection of the job or

activity to be studied; (2) collection of data and information regarding the selected job; (3) questioning of everything affecting the performance of a job; (4) development of possibilities for improvement, and (5) evaluation of results and installation of improved method.

Basically, four actions may be taken to create better methods: elimination, combination, change of sequence, and simplification.

About eight years ago a preliminary study was conducted in the offices of ten Cleveland dentists in an effort to determine the possibility of applying certain work simplification principles to dental office practice. The study stimulated the interest of members of the Ohio Academy of Dental Practice Administration, and a larger group of dentists, all general practitioners, agreed to contribute data to the project. The study had the following objectives:

1. To determine the relative amount of time spent by the average dentist on each phase of office dentistry.
2. To indicate the phases of office dentistry to which further methods analysis and work simplification would be applicable.
3. To determine the relative distribution of time devoted to preparation, productive activity in the oral cavity and clean-up.
4. To provide information to aid the dentist in determining the optimum methods and procedures for his practice.
5. To provide a means of evaluating the potential benefits resulting from better methods and procedures.

Since those studies, some changes have been made in the office of one of the authors. The chair assistant has less movement out of her normal work area. The use of tray set-ups which are available to her in her normal work area allows her to acquire a clean tray set-up and dispose of a used set-up without taking a step. The author has employed an additional chair assistant who is in charge of the "make ready" and "put away" operations. The original chair assistant, who is skilled in working with the dentist while operating procedures are being carried out, is kept busy with these activities specifically.

There is need for cooperative research and work simplification study between dentists and the manufacturers of equipment. The studies can be conducted by the individual dentist and by study groups. Such studies can be of aid to the manufacturer in his effort to supply the dental profession with the equipment that permits most efficient service.

11900 Shaker Boulevard, Cleveland, Ohio

A precious heritage: footnotes on ivory art and dental science

Reidar F. Sognnaes. *J.D.Res.* 37:374-383 June 1958

From the time of the cave man, objects of art and utility have been carved from the tusks of the hairy mammoth; from those of the elephant, whose formidable tusks, the central incisors, are spread apart like canines by the protruding trunk; from the dentin of the mandibular teeth of the sperm whale; from the canines of the walrus and hippopotamus; from the "unicorn" tusk of the narwhal; and, to a lesser extent, from the teeth of other animals, ranging from the polar bear of the arctic to the boar of the tropics. The origin of ivory art can be traced back into human history further than any other form of sculpture. Nearly every conceivable object of art and utility has been fashioned at one time or another from the substance of the teeth.

Talismanic and curative powers have been attributed to teeth and ivory. Ivory combs once were thought to cure headache and to restore hair. Powdered ivory was thought to do this, and more. Walrus ivory was a valued antidote to poison. The Laplanders of northern Norway placed a heated tooth on their gum boils—a tooth for a toothache.

Recent microroentgenographic examination of thin ground sections of ivory show that this substance is divided into broad zones of high and low degrees of calcification. It seems possible that the variations in ivory quality noted by Pliny and Philostratus may now be accounted for, in part, by different proportions in the width of these two zones, and, in part, by the presence of completely uncalcified interglobular dentin substance.

For intricate ivory carving, the ancient Orientals developed hand instruments, many of which

resemble modern dental instruments. In former days, artists in ivory knew how to bend ivory, soften it and reharden it. Several of their formulas have been preserved.

Certain voids in the history of ivory art may be explained by the deterioration and destruction that befell objects of art made from the dentin of animals.

Ivory in times past served as the material of choice for the reconstruction of lost teeth. This material, whether from elephant or hippopotamus, was the last word in dental materials at the time of the first President of the United States.

Harvard School of Dental Medicine, Boston, Mass.

The antiquity of caries

A. J. Clement. *Brit.D.J.* 104:115-123
Feb. 18, 1958

Although dental caries is commonly regarded as a pathological process closely associated with the advent of civilization, the surprising number of instances of caries described in the literature bears testimony to the fact that caries is a pathological condition of considerable antiquity.

The earliest instances of dental caries appear to date back about one hundred million years to the age when reptiles were the supreme terrestrial forms. Dollo (1912) described caries in the lower jaw of a mososaur, and Moddie (1948) in a herbivorous dinosaur.

The occurrence of caries in the early Eocene apes and in the South African prehominids of the Pliocene era (more than 200,000 years ago) is of interest. Caries has not been noted in Neanderthal man, but the remains of Rhodesian man and Mount Carmel man definitely exhibit it.

In Pleistocene times (beginning about 200,000 years ago), the period during which true man probably made his first appearance, the presence of caries is noted in a fairly wide range of mammals.

Caries appears to have affected the hominids at all times during their evolution. Caries has been noted in *Pithecanthropus erectus* and *Homo rhodesiensis*. Caries appears to have accompanied true man (*Homo sapiens*) from the outset of his advent in Palaeolithic times, the incidence of caries increasing considerably during the Neolithic, when it was as high—if not higher—than that demonstrated by many contemporary primitive peoples.

807, Cavendish Chambers, Jeppe Street, Johannesburg, South Africa

The dental service

J. H. Hovell. *Lancet* No. 7038:155 July 19, 1958

The only way in which the dental profession in Great Britain can provide adequate dental care for the whole population, and at the same time recover its status, is through the proper use of the right kind of auxiliaries.

When the young dentist enters general dental practice today, he finds that the one part of National Health Service dentistry which is completely unpaid is the exercise of diagnostic ability and the use of the mental skills toward which his hospital training had been largely directed. He finds that he is doing piecework and that his income for the rest of his career will be tied irrevocably to his output, regardless of its quality.

The alternative is not higher pay for the same job, but a change in the pattern of dental work. The physician works with a host of auxiliaries—physiotherapists, roentgenologists, instrument makers, nurses and the like. This is the way that dentistry also must follow if it is to remain a health profession. Instead of deteriorating into a "hack" craft, dentistry must develop into a prescribing profession, in which dentists themselves undertake only the more advanced procedures.

Dentists should plan and undertake, deliberately, the incorporation into dental practice of the right kind of auxiliaries—not half-trained dentists but completely trained technicians in one branch of technical dentistry. These auxiliaries would work under conditions laid down by the profession. This program would give a better service to the nation, a better status to the dental profession, and would enable dentists to reverse the adverse pattern of earnings. It would enable dentists, like physicians, to increase still further their skill and value to the community.

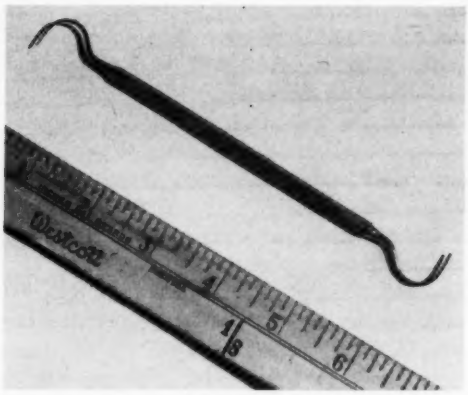
92 Harley Street, London W.1, England

New equipment

The information reported here is obtained from manufacturers. Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*

The "Carpule" sterile needle is designed to be used once and then discarded. Its purpose is to protect against contaminations which cannot be eliminated except by autoclaving. Each Carpule needle is supplied with a needle guard and a dust cap. Illustrated literature is available. *Cook-Waite Laboratories, Inc., 1450 Broadway, New York 18, N.Y.*

"P-C-R" polishing compound remover is a new cleaning agent designed especially for removing tripoli, rouge and other buffing compounds from gold, acrylic and porcelain work. The substance cleans gently and thoroughly, and eliminates the necessity for scrubbing. It cleans hands with no irritation. P-C-R is a concentrated liquid available in polyethylene bottles in 8 ounce and 32 ounce sizes. *J. F. Jelenko & Co., Inc., 136 West 52nd Street, New York 19, N.Y.*

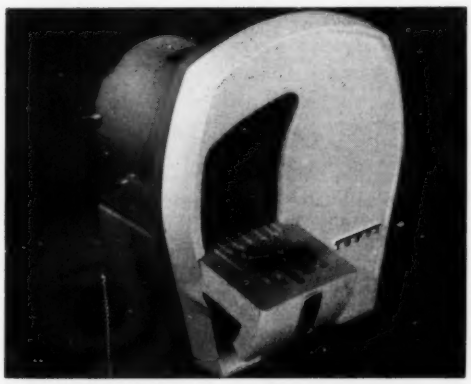


A new instrument for cement base applications is said to provide easier manipulation and to give the dentist better visibility when applying cement to restricted areas. The H. J. Sloan cement instrument is patterned after the no. 23 explorer. It is made of stainless steel and is double-ended. The post has a narrow diameter, with the wire on each side tapered from 0.059 inch at the base to 0.025 inch at the post. There is a gentle arc in the shank. Dentists who wish more information about the applicator, or instructions for home manufacture, may write *The Isaac Rifkin Fund, 80-04 193rd Street, Hollis 23, N.Y.*

An illustrated phonograph record entitled "How to get the most satisfaction from your partial denture" is available for distribution by dentists to their patients. The record is being provided with each Durallium partial denture, to help educate the new wearer of partial dentures. The sound side of the record contains a three-minute message narrated to answer the basic questions asked by many wearers of partial dentures. The other side of the record contains an illustrated message which shows how failure to wear the partial denture every day can lead to breakdown of the dental arch. The 33⅓ rpm record is made of a laminated, plasticized material. *Durallium Products Corp., 809 West Washington Boulevard, Chicago 7, Ill.*

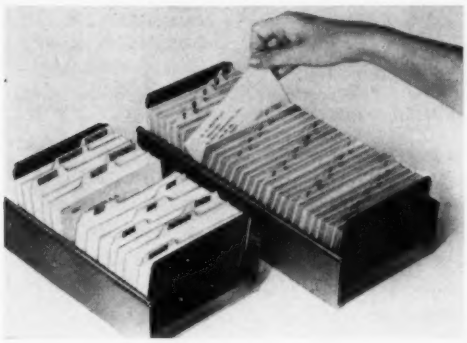
The "Premier" combination air mirror and chip blower permits the dentist to do with one hand what he formerly did separately with two hands holding a mirror and a chip blower. The unit creates better continuous vision even when working in the upper arch under water sprays. The mirror and head can be unscrewed and autoclaved, boiled or cold sterilized. A fitting on the end of a plastic tube can be attached to the cold air syringe. *Premier Dental Products Co., 1001 Chestnut Street, Philadelphia 7, Pa.*

The "Bantam" portable, oil-free piston air pump is designed for efficient, durable operation wherever small volume air is needed at low or high pressure. It measures about 9 by 5 by 8 inches and weighs 10½ pounds. The Bantam is especially suited for operating humidifiers, aerosols or other air-operated equipment. It can be used as a pressure pump or suction pump or both. For literature write *Lee Mfg. Co., 226 West Twenty-second Street, Hialeah, Fla.*



A new model trimmer for the dentist is 12 inches wide, 13 inches high and 15½ inches long. The water distribution system has intake and drainlines underneath for neater installation. Incoming water is fed by the tube to the center of the wheel where centrifugal force gives even coverage with less splashing. The adjustable work table provides for variable angles in cutting. A special orthodontic model has a calibrated work table. *Torit Mfg. Co., Walnut and Exchange Streets, St. Paul, Minn.*

A lightweight aluminum "Card Caddy" facilitates the use of 3 by 5 inch card records. The caddy is available in five lengths (6, 9, 12, 18 and 24 inches); each is 5$^{11}/_{16}$ inches wide and 2¼ inches high. The caddy has a satin gold finish with black styrene front and back followers. It adjusts to hold few or many cards. *Hahn Co., Box 64532, Los Angeles 64, Calif.*



The new centrifugal "Almit Kastmaster" enables the user to produce uniform nonporous castings. The Kastmaster utilizes the Helberger system to complete a casting in minutes, or to cast several pieces at a time. The machine operates dependably up to 2,000° C. It casts gold, silver, steels, stellites, platinum and its alloys. Only a standard 220 volt line is required. *Manufacturing Instrument & Tool Corp., 111-113 Industrial Road East, Clifton, N.J.*

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

A study of the color stability and the time consumed during the insertion of plastic restorative materials in the windows of anterior crowns. *Dorotha Evelyn Hill. 1958.* MS. *University of Michigan.*

An investigation into human head balance. *William A. Heisel. 1958.* M.S. *University of Michigan.*

Epithelial neoplasms of oral minor salivary glands. *Richard T. Murphy. 1958.* M.S. *University of Michigan.*

An electromyographic study of the effects of occlusal interferences on the muscle contraction patterns of the masseter and temporal muscles. *John Edward Porritt. 1958.* M.S. *University of Michigan.*

Influence of enzymes from the microbial flora of caries active and caries immune saliva on the oxidation rate of lactate, pyruvate, and acetate. *George H. Green. 1958.* M.S. *Northwestern University.*

An appraisal by cephalometric radiographs and intra-oral models of unoperated cleft palate and non-cleft palate infants. *Hisao Konishi. 1958.* M.S.D. *Northwestern University.*

A cephalometric radiographic and clinical study of certain occlusal mandibular movements in individuals with excellent anatomical occlusion of the teeth. *Donald D. Dierkes. 1958.* M.S.D. *Northwestern University.*

A cephalometric radiographic investigation of the relations of the hyoid bone, cervical vertebrae, mandible, and cranium in various positions of the mandible in edentulous individuals. *Sherrill Jennings. 1958.* M.S.D. *Northwestern University.*

Ankylosis of the temporomandibular joint (Beitrag zur Ankylose des Kiefergelenkes). *Sigrid Jansen. 1957.* DR.MED.DENT. *University of Cologne, Germany.*

Comparative, clinical and experimental investigations of several available dental amalgams (Vergleichende, klinische und experimentelle Untersuchungen an verschiedenen handelsüblichen zahnärztlichen Amalgamen). *Lothar Mertensmeier. 1957.* DR.MED.DENT. *University of Göttingen, Germany.*

Investigations of the dimensional stability of dental amalgams at different measuring times: modification of Specification No. 1 of the National Bureau of Standards (Untersuchungen über das Dimensionsverhalten von zahnärztlichen Amalgamen bei zeitlicher Verschiedenheit der Messungen: Abänderung der Spezifikation Nr. 1 des National Bureau of Standards). *Hans Joachim Schill-Szyja. 1957.* DR.MED.DENT. *University of Göttingen, Germany.*

Re-examinations of patients in whom plastic surgery had been performed to obtain more favorable retention of complete dentures: evaluation of plastic-surgical methods used at the Dental Clinic of the University of Halle (Nachuntersuchungen von Patienten in denen plastisch-chirurgische Eingriffe zur Verbesserung des Haltes von totalen Prothesen gemacht wurden: Auswertung der plastisch-chirurgischen Methoden ausgeübt an der Universitäts Zahn-, Mund- und Kieferklinik Halle). *Marlene Schaps-Bernzott. 1957.* DR.MED.DENT. *University of Halle/Saale, Germany.*

Evaluation of external pin fixation in fractures of the lower jaw (Zur Beurteilung der äusseren Knochennagelung bei Unterkieferfrakturen). *Werner Oertel. 1957.* DR.MED.DENT. *University of Halle/Saale, Germany.*

Alloplastic restorations in the lower jaw: a clinical and historical study (Alloplastischer Unterkieferersatz: Eine klinische und historische Studie). *Albrecht Schönberger. 1957.* DR.MED.DENT. *University of Halle/Saale, Germany.*

Investigations of the effects of ammoniated tooth pastes on *Lactobacillus acidophilus* and five other bacteria (Untersuchungen über die Wirkungen ammonisierter Zahnpasten auf *Laktobazillus acidophilus* and fünf weitere Bakterien). *Christel Voll-Reinke. 1957.* DR.MED.DENT. *Humboldt University, Berlin, Germany.*

Clinical investigation of the influence of ammoniated dentifrices on hyperalgesia of dentin (Klinische Untersuchungen über die Beeinflussung der Dentinhyperalgesie durch ammonisierte Zahnpflegemittel). *Eckard Voll. 1957.* DR.MED.DENT. *Humboldt University, Berlin, Germany.*

Antibiotic treatment of actinomycosis since 1948 (Ergebnisse der Aktinomykosebehandlung mit Antibiotika seit dem Jahre 1948). *Ludwig Wagner. 1957.* DR.MED.DENT. *University of Leipzig, Germany.*

Macroscopic anatomy of the teeth of the swamp beaver, *Myocastor coypus,* used for determination of age (Makroskopische Anatomie der Zähne des Sumpfbibers, *Myocastor coypus,* in der Altersbestimmung). *Klaus Dieter Jentzsch. 1957.* DR.MED.DENT. *University of Leipzig, Germany.*

Condition of the dentition and caries incidence in school children, from 6 to 18 years old, in the City of Dresden (Der Zustand des Gebisses und Kariesbefall bei schulpflichtigen Kindern, im Alter von 6 zu 18 Jahren, in Dresden-Stadt). *Günther Walter. 1957.* DR.MED.DENT. *University of Leipzig, Germany.*

Paper chromatographic examination of healthy and gangrenous human tooth pulps (Papierchromatographische Untersuchungen normaler und gangränöser menschlicher Zahnpulpen). *Franz Ludwig Waldmann. 1957.* DR.MED.DENT. *University of Munich, Germany.*

Treatment of osteomyelitis of the mandible with oxytetracycline (Il trattamento delle osteomieliti della mandibola con la ossitetraciclina). *Paoli Oreadi. 1957.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Genoa, Italy.*

Dysendocrisiasis and periodontal disease (Disendocrinie e paradenziopatie). *Mario Asti. 1957.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Genoa, Italy.*

History of dentistry and orthodontics (Storia dell'odontoiatrica e dell'ortodonzia). *Brenna Gian Giuseppe. 1957.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Pavia, Italy.*

Tooth mobility and orthodontic treatment (Il movimenti dei denti con i vari apparecchi ortodontici). *Giampaolo Boidi. 1957.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Pavia, Italy.*

Apical granuloma associated with rheumatism (Rapporto fra granuloma apicale e reumatismo). *Alessandro Moro. 1957.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Pavia, Italy.*

Vitamin K and experimentally produced caries (Vitamina K e carie dentaria sperimentale). *Luigi Vismara. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Pavia, Italy.*

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